The Dissertation Committee for Curba Morris Lampert
certifies that this approved version of the following dissertation:

LEARNING AND CORPORATE EVOLUTION:

A LONGITUDINAL STUDY OF HOW PRODUCT-MARKET RELATEDNESS AND ENVIRONMENTAL RELATEDNESS IMPACT FIRM SCOPE

Committee:

_____
Gautam Ahuja, Co-Supervisor

_____
George P. Huber, Co-Supervisor

_____
James W. Fredrickson

_____
David B. Jemison

_____
Prabhudev C. Konana

LEARNING AND CORPORATE EVOLUTION:

A LONGITUDINAL STUDY OF HOW PRODUCT-MARKET RELATEDNESS AND ENVIRONMENTAL RELATEDNESS IMPACT FIRM SCOPE

by

Curba Morris Lampert, B.A., M.P.P.

Dissertation

Presented to the Faculty of the Graduate School of

the University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2003

Dedication

This dissertation is dedicated to my fabulous husband, Alan. His love, support and humor have made the “lows” bearable and the “highs” unforgettable.

Acknowledgements

I would like to thank the many people that have made this dissertation possible. First and foremost, I would like to thank my primary advisor, my greatest mentor and my dear friend, Gautam Ahuja. Gautam and I started working together from the first day of my doctoral program. He has loyally stood by me for six years. Gautam helped me through the dark days and could always bring a smile to my face. I am so grateful to have had such a wonderful advisor. Gautam's amazing dedication made this dissertation a reality and I will be eternally thankful for everything that he has done.

I would also like to thank the rest of my committee, George Huber, Jim Fredrickson, Dave Jemison and Dave Konana, for their encouragement and commitment. Aside from my committee, Johnny Butler also made important contributions to my success at Texas and I am very appreciative.

It has been said that nobody can understand and support you as much as those that have climbed the mountain with you. I think that this is especially true in getting a Ph.D. It is a long, tiring and emotional journey, which requires a lot of commiseration, humor and good wine to survive. I was very fortunate to be surrounded by a wonderful circle of budding academics at Texas with which to empathize amongst. In chronological order, I'd like to thank my "assigned" student mentor, Mike Frandsen (Strategy), for six years of great advice. Mike didn't know at the time that he was signing up for the position for life, but he has

graciously accepted the post. Lisa Millici Gaynor (Accounting), and her husband Dan (Economics), receive a very special thank you for many years of sharing laughs, tears and Lisa's fine Italian cooking. Paul Goodrum (Engineering), and his wife Sarah (Sociology), earn a distinctive thank you for their warmth, charm and "Kentucky-style" hospitality. David Nino (Strategy) obtains a heartfelt thank you for the every "Monday night progress check" phone calls, for being a comic soul mate and for cursing just as much as me during this program. Jim Schmidtke (Organization Science), and his wife Jen (Psychology), get a standing ovation for their ability to always correctly analyze a situation, assign an action plan and advise on clothing, correct in both style and season. Mat Hayward (Strategy), and his wife Kristin (Strategy), deserve special mention for their kindness, strength and encouragement. Fate has brought us together twice, and I am hoping that for our third time, it will be for good.

Lastly, so many members of my family and so many of my friends have provided support and encouragement. At the top of the list, my fabulous husband Alan. Enduring this journey with me only confirmed what I already knew – I married the greatest man in the world. Thank you for everything. Special recognition is also due to the amazing Sherry Garmon, who suggested the Ph.D. route to me eight years ago on our way to Stucchi's (for ice cream, of course) during our Michigan days. I will always be indebted to you, Sherry. I would also like to acknowledge a talented, generous and brilliant set of professors from both

UC Irvine and Michigan that inspired, encouraged and shaped who I am today – a deep thank you to Garry Brewer, Stu Hart, Aneel Karnani and Paul Von Blum. I was fortunate enough to gain a close group of friends from Michigan that supported me through getting a Masters, a wedding in Austin, as well as a Ph.D. Thank you and forever "Go Blue!" to my policy pals Tommy Doan, Elina Erlendsson, Anne Levine, Eric Limbs and Hardy Vieux; to my business school pals Mike Ainge, Sherry Garmon, Anne Marie Jacks and Yair Klein; and to my law school pal and favorite roommate, Anna Lincoln Spradlin. Using the words of Gautam, I still believe that "all roads lead back to Ann Arbor". At the risk of leaving someone out…Thank you Mom & Dad, Rana & Tom, Nikki & Don, Fern & Di, Jason, Shannon & Rick, Marilyn & Felix, Chris & Steve, Judi & James, Pat & Bill, Gib & Camilla, Tommy & Carolyn, Jimmy & Olga, Arlene & Dale, Nora & Robert, Shani & Michael, Jennifer, Gretchen & Paul and Nils & Rebecca.

Hook 'em Horns!

Curba

LEARNING AND CORPORATE EVOLUTION:

A LONGITUDINAL STUDY OF HOW PRODUCT-MARKET RELATEDNESS AND ENVIRONMENTAL RELATEDNESS IMPACT FIRM SCOPE

Publication No. _____

Curba Morris Lampert, Ph.D.
The University of Texas at Austin, 2003

Supervisors: Gautam Ahuja and George P. Huber

I examine corporate evolution, i.e. how a firm changes its scope through diversification into new businesses and exits from existing ones and what it learns from this process. I analyze the *type* of scope experience acquired by the firm, and suggest that the firm's scope decisions entail two types of learning, product-market learning and environmental learning, that have distinct effects on the firm's future scope choices. I suggest that by failing to account for environmental differences and focusing too closely on product-market relatedness, firms may be misled into presuming that potential new businesses are much closer to their existing businesses than they truly are. I use longitudinal data on the Fortune 250 firms to test these arguments and show that ignoring environmental relatedness may be one

explanation for an unanswered riddle in the strategy literature: why does related diversification fail?

Table of Contents

List of Tables

1 Introduction

1.1 Introduction

Received research suggests that a firm should seek scope changes in a direction similar to its existing activities. This way, the firm's current capabilities will be related to what is required in the new industry, allowing the firm to enjoy synergistic benefits from doing both activities as opposed to only doing one of them. However, researchers have found that although related diversified firms outperform unrelated diversified firms on average, related diversification is *no guarantee* of a favorable risk/return performance, and many related diversifiers do badly (Bettis & Mahajan, 1985). This prompts the natural question: "Why does related diversification fail?" I investigate both the entry and exit decisions of firms over time in search of an answer to this question. More specifically, in this dissertation I examine corporate evolution, i.e. how a firm changes its scope through diversification into new businesses and exits from existing ones and what it learns from this process. I ask two questions: (1) How does the firm's learning affect the direction of its entry choices?, and, (2) How does the firm's learning affect the direction of its exit choices?

To answer these research questions, I analyze the *type* of scope experience acquired by the firm, and suggest that the firm's scope decisions can lead to two

types of learning; product-market learning and environmental learning. I argue that by evaluating a firm's scope choices in terms of their contribution to these two types of learning, I can predict the firm's future scope choices (which businesses a firm will enter or exit). I suggest that by failing to account for environmental differences and focusing too closely on product-market relatedness, firms may be misled into presuming that potential new businesses are much closer to their existing businesses than they truly are.

I use longitudinal data on multi-unit firms competing in multiple industries to test the key aspects of these arguments. I estimate two equations addressing the scope decisions of both entry and exit. The first equation relates the type of scope experience acquired by the firm, in terms of product-market and environmental learning, to the firm's subsequent entry choices, i.e. whether the firm acquires a given business. The second equation relates the type of scope experience acquired by the firm to the firm's subsequent exit choices. I measure the dimensions of a firm's scope choices, which includes all of its strategic business unit diversification/entry or divestment/exit activities, longitudinally to accurately capture the phenomenon of corporate evolution.

I believe that taken together, the findings of this study will provide evidence that what a firm learns (*type* of scope experience) does indeed affect the organization's performance. I argue that for diversified firms to succeed, they need to account for both product-market relatedness and environmental relatedness

between existing and new businesses. Firms that enter businesses with related product-markets but dissimilar environments are more likely to perform poorly than firms that enter businesses with both related product-markets and environments. I theorize and expect to find that firms will be more likely to pursue product-market and environmental choices that are similar to their previous product-market and environment experiences.

1.2 Conceptual overview

1.2.1 Theoretical perspectives

I draw upon three literatures to build my arguments. First, the underlying approach in this dissertation is based on the resource-based view of the firm. The unit of analysis is the firm. I examine the knowledge building capabilities of firms and I argue that firms differ in how they develop their knowledge building capabilities, and include firm-level factors as both independent and control variables to emphasize the role of firm heterogeneity in my analysis of corporate evolution. I argue that a firm's knowledge building capability is subject to "time compression diseconomies" (the firm must have the necessary time to develop its internal capabilities) and it is dynamic, therefore an analysis must take place over time (Dierickx & Cool, 1989). I also argue that through such an analysis, it will become apparent that certain directions of growth *as well as decline* are more

appropriate given the firm's distinctive knowledge building capabilities (Penrose, 1959). Thus, based on a firm's knowledge building resources, its corporate evolution can be predicted with respect to both direction and success. Accordingly, the resource-based view of the firm can help us to understand a fundamental question in strategy; how does a firm develop a unique resource that serves as a sustainable advantage (Porter, 1980; Barney, 1986).

Second, I build on the organizational learning perspective. This study joins the literature's discussion of knowledge acquisition through an analysis of organizations learning from their own experience (Huber, 1991). Accumulating useful knowledge is one of the key objectives of a firm (Grant, 1996). Yet, not all scope choices are equal in this respect. Different experiences give way to different types of learning and knowledge. I argue that a firm's experiences can develop into two types of learning, product-market learning and environmental learning, which contribute to the firm's knowledge differentially. Adopting this perspective can also be helpful in shedding light on a fundamental question: how does organizational learning influence the future choices and performance of firms?

Third, I build on the evolutionary economics, path dependence and strategic decision-making literature. I argue that firms develop organizational practices and routines that are specialized to specific environments. When firms expand into new businesses, such businesses can differ from firms' existing experiences along two dimensions. First, the product-market knowledge required to successfully compete

in the new business may differ. Second, the environment of the new business can be different in terms of its basic characteristics such as munificence, complexity and dynamism. For instance, mainframe computers and personal computers may both require an understanding of the same computing technology and manufacturing processes. Thus, the underlying product-market knowledge may be the same for both businesses. Yet, the actual competitive environment of these two industries may be widely different and may demand very distinct organizational routines, practices, and dominant logics. Thus, the environmental knowledge elements may be very different.

Thus, even though firms that have participated in a business may have a good understanding of the product-market knowledge required for the new business, without an understanding of the environmental knowledge required to compete in the new business in terms of routines and practices, an expansion into such new businesses could be unsuccessful.

1.2.2 Motivation

From the perspective of the organizational learning perspective, "more effort has gone into identifying knowledge as the basis of competitive advantage than into explaining how organizations can develop, retain and transfer (their) knowledge" (Argote & Ingram, 2000, p.156). To help in this aim, this study

contributes to the notion of exercising appropriate judgment in a firm's scope decisions. I argue that the direction of the firm's corporate evolution can be managed proactively by the firm in order to build up its knowledge base and develop its learning skills. There is little work on how firms can conduct their strategic choices aptly, in order to maximize their firm's learning experience and knowledge accumulation. This study seeks to fulfill this objective. I also argue that the literature's notion of experience, with respect to a firm learning from its own experience, can be broken down into at least two distinct types (product-market and environmental experiences), and claim that these different types of experiences can generate different learning capabilities for the organization. As a result, this study helps to fill multiple gaps in the organizational learning literature.

This research also responds to a call for "better theories of learning that will more gracefully accommodate the effects of history and timing on organizational events…focus on the mapping process and provide structured insight into how a sequential stream of experience becomes the basis for action" (Cohen & Sproull, 1991, Editor's Introduction). In this dissertation, my analysis of corporate evolution will take into account the effects of a firm's history and timing on an organization's activities and how this impacts its future organizational actions. I examine the firm's scope decisions where learning is accumulated and argue that a firm's scope choices affect its future selections.

Third, from the evolutionary perspective, the study contributes to the idea that firms are cumulative repositories of both codified, formal knowledge as well as tacit, firm-specific learning embodied in the firm's collective routines (Nelson & Winter, 1982). Since every firm is different, each firm edges along its own unique path into the future, constrained by what it has been capable of doing in the past but *selecting* the best alternatives that it can for itself, given the limitations of bounded rationality (Nelson & Winter, 1982). Therefore, at any point in time, firms will display a substantial amount of *variation* amongst themselves because each is composed of its own capabilities and decision rules and expertise (Nelson & Winter, 1982; Dosi, 1988). This dissertation attempts to test the hard to measure evolutionary constructs of cumulative learning, tacit knowledge, and path-dependency in multi-unit firms competing in multiple industries. I investigate the scope choices of firms, and hope to extend the notion of path-dependency and improve our understanding of the underlying processes of corporate evolution.

1.2.3 Research design

I test the hypotheses of a firm's future scope decisions using a longitudinal data set of multi-unit firms competing in multiple industries. Longitudinal data from the study period of 1981 to 1989 allows for the testing of the causal

arguments as well as the dynamic aspects of the firm's evolution. The main empirical method applied in this study is longitudinal regression analysis.

1.3 Contributions

This dissertation has three main theoretical contributions, as well as implications for empirical work and practice. First, this research responds to a call to address the strategic role of different types of experience. Ingram and Baum (1997) suggest that "different types of experience generate different capabilities for the organization and the arguments about the strategic role of experience cannot ignore this" (Ingram & Baum, 1997). In my analysis, I argue that with respect to a firm learning from its own experience, this notion can be broken down by way of at least two features (product-market and environmental experiences), and claim that that these different types of experience can generate different learning capabilities for the organization. Thus, I hope to increase our understanding about the strategic role of experience.

Second, from the perspective of strategy, and specifically the literatures on corporate diversification and evolution, this study contributes significantly to the notion of relatedness. In the diversification literature, one important area of focus has been the direction of diversification, which investigates the "basis and extent of relatedness between the new and old lines of activity" (Ramanujam & Varadarajan,

1989). The theoretical reasoning behind why related diversification should be beneficial is that the related tasks rely to some degree on shared skills or resources, allowing the firm to enjoy synergistic benefits from doing both activities as opposed to only doing one of them. Various dimensions have been used to investigate the direction of diversification, including industries, technologies, products and services, geographic markets, customer segments, and distribution channels (Christensen & Montgomery, 1981; Palepu, 1985; Roberts & Berry, 1985; Varadarajan, 1986; Varadarajan & Ramanujam, 1987; Haveman, 1992; Mitchell, 1989). In this dissertation, I make a distinction between product-market and environmental relatedness, based on my definition of product-market and environmental learning. In doing so, I open up the notion of relatedness by expanding its dimensions.

Third, my dissertation shows how this new environmental relatedness factor can explain why even many related diversifiers don't perform well, as they fail to account for the environmental dissimilarity in the acquired business. I introduce environmental relatedness as an important factor in corporate diversification and evolution, and one that earlier research has ignored. I make a case that environmental learning taps into the concept of the dominant logic of the organization (Prahalad & Bettis, 1986). This dissertation hopes to bring new light onto these important topics of corporate diversification and evolution.

From an empirical standpoint, this research contributes to the empirical testing of many theoretical ideas in the resource-based view, organizational learning and the evolutionary perspective, and thus responds to the many calls for more work in this area.

Finally, a better understanding of how firms can conduct their strategic choices more appropriately, in order to maximize their firm's learning experience and knowledge accumulation, has managerial implications. Top management teams can evaluate their firm's learning capabilities more thoroughly and select their firm's next strategic choices accordingly. This strategy will allow the firm to leverage its prior knowledge and learning and thus, increase its performance in its strategic choices both now and in the future.

2 Literature review

In this chapter, I review the core theories and concepts that have been used in the literature in the context of corporate evolution. Throughout the section, I will also review the relevant empirical work and findings applicable to my study. As I clarified in Chapter One, I am interested in understanding the determinants of the direction of a firm's evolution, i.e. the firm's scope changes including diversification/entry and divestment/exit. I first investigate prior literature within the theoretical traditions of industrial organization economics and the resource-based view with respect to my question of interest. Thereafter, I review relevant aspects regarding the direction of a firm's evolution within the organizational learning, evolutionary economics and strategic decision-making perspectives.

2.1 Literature Review on Product-Market Determinants

2.1.1 Industrial Organization Economics

Industrial Organization economics (IO) focuses on the structure of markets, the conduct of firms, and the performance that results from this, with respect to both consumers and producers (Scherer & Ross, 1990). The paradigm of IO most commonly applied to strategy, the Structure-Conduct-Performance (SCP) approach, has been used to address issues relevant to this dissertation's focus. From this

perspective, patterns of corporate entry and exit from a business are likely to be determined by the "market structure" of the relevant industries (Scherer, 1980; Shepherd, 1979; Caves, 1987). More specifically, the various structural characteristics that affect entry or exit include concentration of sellers and buyers, product differentiation, barriers to entry, cost structures, demand growth and firm size.

Firms prefer to compete in highly concentrated markets, in which a handful of firms have the majority of the market share, because it has been positively linked to performance (Collins & Preston, 1968; Miller, 1969; Gale, 1972; Dalton & Penn, 1976). Highly concentrated industries can result from enduring scale economies, where large producers obtain a lower cost per unit than smaller producers (Scherer, 1980). Through their heavy volume, large producers can gain significant market share, and their efficiency in production is rewarded with high performance. Another explanation for this positive relationship between high concentration and elevated performance is the market power argument, where according to Shepherd, "market power is the ability of a market participant or group of participants… to influence price, quality, and the nature of the product in the marketplace" (Shepherd, 1970, p.3). Clearly, the market power argument takes a collusive tone, where firms use their power to set high prices, leading to higher profits.

Industries characterized by high growth rates are also attractive entry choices. If firms find themselves in a situation where the industry they serve has

stagnant or even declining growth, they can expect that the level of rivalry among the firms to increase over the shrinking market pie. In contrast, industries with high growth rates represent a growing market with increasing opportunities, potentially less intensive rivalry and where prices can be placed well over costs. Further enticing entry into high growth industries is the argument that industries with rapid growth *actual favor new entrants* because "rapid growth is often indicative of fundamental shifts in technology or in consumer demand, which should erode incumbents' competitive advantages relative to diversified entrants" (MacDonald, 1985). In any case, research has shown a positive relationship between industry growth rates and firm or industry profitability (Gutmann, 1964; Rhoades, 1973; Bass, *et al.*, 1978; George, 1968).

Though industries that maintain high concentration levels and high growth rates are attractive candidates for entry, if the lure of high potential returns attracts too many entrants, incumbent firms' market share could become eroded and/or their coordination of prices could become weakened. Anticipating this situation, incumbents will try to erect entry barriers to screen out potential entrants. Entry barriers can include economies of scale, product differentiation, capital requirements, switching costs, access to distribution channels, as well as cost disadvantages independent of scale (Porter, 1980). Consequently, even though an industry may display some attractive structural characteristics, it may also retain others that make entry into it unattractive, such as high entry barriers. Thus, the

SCP approach highlights the importance of firms evaluating multiple structural characteristics of an industry before selecting it as an entry and exit choice.

A second prediction from the IO/SCP perspective is that firms will seek scope or skill economies across their activities. Researchers recognized that a multi-market firm could enjoy significant cost savings when it would run multiple product lines within one firm, generating economies of scope (Baumol, Panzar & Willig, 1982). Economies of scope or skill occur when a firm can share its inputs (inputs in the strategy realm are commonly referred to as resources) across its many businesses (Bailey & Friedlaender, 1982; Panzar & Willig, 1981). Teece (1982) has extended the economies of scope and skill argument by introducing rudiments from transaction costs economics (TCE), and argues that firms will select entry choices where it can both reapply its inputs *and* where market failure exists with respect to these inputs (Teece, 1980; 1982). These two requirements help to justify the existence of the multi-business firm since making contractual arrangements through the market regarding inputs characterized by specificity, tacitness, and embeddedness can be hampered (Teece, 1980; 1982). Overall, the economies of scope and skill observation results in a vital implication for the direction of a firm's scope choices. Accordingly, a firm will choose to diversify in a direction that enables it to achieve the benefits of scope economies (Teece, 1980; 1982).

Empirical research

Empirical work on patterns of corporate entry and exit from a business has shown that structural characteristics do indeed impact these decisions. In one of the first comprehensive diversification studies, Gort (1962) found that diversifying firms were significantly attracted to high growth industries. In addition to this important finding, he also discovered that firms were attracted to industries that maintained a high rate of technological change (Gort, 1962). Similarly, in Lemelin's (1982) study of firm's diversification choices, in terms of origin and target industries, he also finds that high growth industries attract entry. Lemelin (1982) also finds that an industry characterized by high concentration seems to act as a barrier to entry rather than an inducement to entry through high potential returns. Work by MacDonald (1985) also confirms the results that high growth industries attract entry and high industry concentration deters entry.

Turning now to the empirical studies where firms seek scope or skill economies across their businesses, Teece (1980) investigates petroleum firms and provides empirical evidence that firms' diversification choices can be explained by their similarity in technological resources and skills. Likewise, the work by Gorecki (1975) and Lecraw (1984), find that firms will choose to enter industries where they can transfer and reuse their resources in both advertising and research and development. In addition, Lemelin (1982) finds that firms will choose to diversify into industries that are related to their base industry in terms of "industrial

complementarity", which is a unique way to tap into the similarity between buyer/seller relationships among industries (Lemelin, 1982). Just as research and development and marketing similarities between a firm's base and target will attract entry, MacDonald (1985) discovers that exit is more likely to occur in industries where there is a mismatch in research and development and marketing orientation. Altogether, these researchers have argued that their empirical findings indicate that a firm is composed of certain "specific assets" or skills, and that these skills will direct a firm's entry and exit selections in such a way that allows the firm to obtain scope or skill economies across its businesses (Lemelin, 1982; MacDonald, 1985; Stewart, Harris & Carleton, 1984).

Conclusion

The IO/SCP perspective indicates that patterns of corporate entry and exit from businesses are likely to be determined by the market structure of an industry and in directions where scope or skill economies can be derived from the firm's activities. From my empirical review, I note that researchers have established: (1) that patterns of corporate entry and exit from businesses are not random, and are affected by market structure, (2) as well as issues regarding relatedness, and (3) yet, while the IO/SCP paradigm focuses on both structural characteristics and issues of scope and skill economies, both of these important issues spotlight the harder

"know what" aspects of a business, where the softer "know how" issues are omitted.

Structural characteristics and scope and skill economies focus on the concrete, hard facts and "know what" required to successful compete in a selected business, yet this stops short of investigating the *context* in which that firm came to know these things. For instance, the IO/SCP perspective argues that a firm will select a business to enter if it knows what it is required to overcome certain entry barriers and/or if it can share its existing knowledge of advertising in the new industry. However, this focus is on the content or "nuts and bolts" knowledge, and neglects to investigate the *context* in which that firm came to know these things. I argue that the environmental context in which a firm absorbs its knowledge is equally important to corporate entry and exit decisions, and an investigation into environmental context represents the forgotten "know how" issue.

2.1.2 The Resource-Based View

The resource-based view (RBV) adopts a more dynamic perspective than the IO/SCP viewpoint, making it attractive for the examination of corporate evolution. The RBV focuses on factors *within* the firm for answers to firm behavior, as opposed to the IO/SCP approach that concentrates on industry/market structure factors for its explanations. While developing a theory of firm growth,

Edith Penrose brought analyses down to the level of the firm, which she referred to as the "internal world" (Penrose, 1959, p.65). Penrose asserted that the theoretical mechanism underlying firm expansion arises from the firm's administrative unit trying to decide how best to achieve efficiency benefits from its "pool of unused productive services, resources, and special knowledge, all of which will always be found within any firm" (Penrose, 1959, p.66). She argued that the firm will never find a resting place, thus it will always be in state of flux from its pool of resources because it continually presents the firm with three obstacles:

> "those arising from the familiar difficulties posed by the indivisibility of resources; those arising from the fact that the same resources can be used differently, under different circumstances, and in particular, in a 'specialized' manner; and those arising because in the ordinary processes of operation and expansion new productive services are continually being created" (Penrose, 1959, p.68).

The RBV argues that a firm's pool of resources will drive the direction of its expansion choices. However, researchers within the RBV tradition argue that not all unused productive resources of a firm should dictate its direction; only those that can create a distinctive competence and serve as the basis of the firm's competitive advantage (Selznick, 1957; Salter & Weinhold, 1979; Porter, 1985, 1987; Wernerfelt, 1984; Barney, 1991). The firm should evaluate its stock of heterogeneous resources and concentrate on developing those that are valuable, rare, imperfectly imitable, non-substitutable (Barney, 1991; Dierickx & Cool, 1989; Peteraf, 1993). By targeting its rent generation activities from these superior

resources, the firm can attempt to create a competitive advantage that will not be easily competed away by other organizations and earn superior profits (Amit & Schoemaker, 1993). These superior resources should also serve as the foundation upon which the firm builds its interrelationships across its different businesses (Porter, 1985). As the firm shares and reinforces its superior resources across its businesses it creates more opportunities for itself to discover potential synergies, which results in the firm's resources accruing even more value as well as expanding its resource pool through new combinations of resources (Porter, 1985;1987). The process by which a firm grooms and accumulates its superior resources and develops its capabilities is subject to "time compression diseconomies" (meaning, the firm must have the necessary time to develop its internal capabilities) and it is a dynamic process (Dierickx & Cool, 1989).

The RBV idea of a firm sharing its strategic resources across its businesses to maximize its opportunities for potential synergies has implications in the context of corporate evolution. This insight indicates that *relatedness matters* and a firm will pursue its scope decisions based upon whether it can reuse its strategic resources between its existing and targeted businesses. Diversification into related businesses and divestiture out of unrelated businesses allows the firm to focus on maintaining and reinforcing those strategic resources that can provide it with potential synergies and a source of competitive advantage. Thus, the RBV indicates that relatedness can affect corporate evolution.

Empirical research

Empirical work on the direction of corporate entry and exit from a business has shown that the issue of relatedness plays a significant role in these decisions. The "relatedness" notion within the RBV has a history that can be traced back over thirty years to the work by Chandler (1962) and Wrigley (1970), though Rumelt (1974, 1977, 1982) is credited with being the first to empirically test the idea of relatedness when he linked a firm's diversification strategy to its performance. Rumelt's criteria of relatedness in diversification included whether the firm (1) functions in similar markets using similar distribution channels, (2) employs similar production technologies, and (3) used similar scientific research (Rumelt, 1974). Rumelt's early work started out with a categorical measure of relatedness, where a firm is classified into one of several distinctive types of diversification. Now however, continuous measures of relatedness are more common in the literature, which place the firm on a scale that determines its extent of related or unrelated diversification. Most continuous measures are derived from the Standard Industrial Classification (SIC) system. The SIC system uses several criteria to categorize establishments into industries, such as raw materials, production processes, and end uses of the products. Though the SIC derived measures represent a notion of relatedness based primarily on product-markets, researchers have identified that relatedness can occur along several other dimensions, including technologies,

activities, and human capital. I will now review the empirical findings from these four dimensions.

Empirical work on scope choices and performance has shown that relatedness based on product-markets impacts these decisions. Christensen & Montgomery (1981) built on the work by Rumelt (1974), by updating his study and examining the effect of market structure, in addition to product-market relatedness, on the diversification-performance relationship. The authors find support for diversification categories and market structure variables, and conclude that the market structure variables have a moderating effect on the diversification-performance link (Christensen & Montgomery, 1981). Rumelt (1982) extends his own research by also including market structure effects, and continues to find that the more product-market diversity a firm maintains, the lower its profitability. He concludes that his results support the argument that the less product-market diversity a firm maintains, the more efficiency gains the firm reaps by making the most of its core factors, idiosyncratic investment, and uncertain imitability (Rumelt, 1982).

In their work on patterns of corporate entry and exit from a business as well as scope choices and performance, RBV researchers have expanded the notion of relatedness to include other dimensions such as technology, in addition to product-markets. Singh and Montgomery (1987) investigate corporate acquisitions with shared technological resources and similar product-markets and find that these

related acquisitions result in superior economic returns than unrelated acquisitions. Delving into technology services, Robins and Wiersema (1995) investigate the technology flows among industries and find that firms that have diversified into technologically related industries have higher corporate performance than firms that diversified into technologically unrelated industries. Also focusing on technology, Silverman (1999) determines that a firm's technological services direct its diversification choices to other technologically related industries. His study is the first to use a firm's patent data to determine its technological services.

Besides technology, researchers have looked at other dimensions of relatedness including a firm's activities, and its relationship to a firm's scope decisions. Montgomery and Hariharan (1991) tap into a firm's activities (though they refer to them as resources), using the advertising and R&D spending patterns of firms. The authors find that firms choose to diversify into industries that maintain similar activity attributes. Likewise, Chatterjee and Wernerfelt (1991) also looked at advertising and R&D intensity, and found that these activities influenced a firm towards pursuing similar diversification choices as well. Both of these studies took into account market structure variables and still found strong support that firms will choose scope choices where the activities are similar to those in their existing businesses.

In addition to product markets, technology, and activities, empirical work on scope decisions has shown that relatedness based on human resources impacts

these choices as well. The impact of human resources on the direction of a firm's scope choices was delayed in large part due to the difficulty in obtaining measures of human resources. Recently, however, researchers have surmounted the challenge and identified a source in which to trace a firm's human resources with, via the Occupational Employment Survey (OES), furnished by the Department of Labor Statistics. By using this source, Farjoun (1994) finds that firms pursue diversification choices related to their existing human resource profile. He examines the firm's diversification choices using the distinctive concept of resource-related industry groups, which he developed (Farjoun, 1994).

These different dimensions of relatedness have all tried to tap into the influence and efficiency gains that come from related choices, with respect to potential synergies and a firm's extension of its core factors. Though researchers have empirically linked relatedness in terms of product markets, technologies, activities and human resources to corporate entry and exit as well as to performance, other empirical results indicate that the relationship may not be so simple. Bettis and Mahajan (1985) investigated the risk/return tradeoff in accounting profits for 80 related and unrelated diversified firms. In their examination, they find that although related diversified firms outperform unrelated diversified firms on average, related diversification was *no guarantee* of a favorable risk/return performance (Bettis & Mahajan, 1985). The authors conclude from their results that:

> "although related diversification is a necessary condition, *it is not a sufficient condition* to achieve a desirable risk/return performance… managers should not rely on a related diversification strategy to achieve performance... much more is needed." (Bettis & Mahajan, 1985, p.796).

Thus, even though firms may have selected related scope choices and therefore have the opportunity to tap into potential synergies and share their core factors, the results by Bettis & Mahajan (1985) point out that our current explanation of the under workings of relatedness may not be enough and is in some way incomplete. This indicates that more investigation is necessary to increase our understanding and discover the true relationship with respect to relatedness; it is my hope that further investigation will shed more light on this important point and explain why it is that all related diversifiers do not excel; in fact, some related diversifiers do poorly (Bettis & Mahajan, 1985).

Conclusion

The RBV approach indicates that focusing on the firm allows us to get closer to the phenomenon of interest, and that relatedness does matter when a firm is trying to share its strategic resources across its businesses to maximize its opportunities for potential synergies and gain a competitive advantage. From my empirical review, I note that researchers have established: (1) the view that market structure is important in determining the direction of diversification and performance, as argued by the IO/SCP perspective, is reinforced by work in this

tradition (Christensen & Montgomery, 1981; Montgomery and Hariharan, 1991; Chatterjee and Wernerfelt, 1991); (2) work on the direction of corporate entry and exit from a business as well as scope choice and performance has shown that the issue of relatedness plays a significant role in these decisions. The different dimensions used to tap into the notion of relatedness has expanded, and now includes product-markets (Christensen & Montgomery, 1981; Rumelt, 1982), technologies (Singh and Montgomery, 1987; Robins and Wiersema, 1995; Silverman, 1999), activities (Montgomery and Hariharan, 1991; Chatterjee and Wernerfelt, 1991), and human capital (Farjoun, 1994); (3) though researchers have used different dimensions of relatedness to tap into the influence and efficiency gains that come from related choices and have linked these to corporate entry and exit as well as performance, other empirical results indicate that the relationship may not be so clear cut. Importantly, the RBV doesn't explain why even among related diversifiers there is considerable variance in performance; in fact, some related diversifiers indeed do poorly (Bettis & Mahajan, 1985); (4) finally, even though research in the RBV tradition has expanded considerably the menu of considerations to reflect relatedness (e.g. product markets, technology, human capital, etc.), the focus still remains on essentially content or "know what" issues. The *context* or "know how" aspects have not been examined.

2.2 Literature Review on Environmental Determinants

2.2.1 Organizational Learning Theory/ Evolutionary Economics Theory

Research in the organizational learning and evolutionary economics (OL/EE) perspectives has suggested several implications of relevance for this study. Some of the core propositions from these streams of research that I shall build on include: organizational learning is the accumulation of past inferences, stored in routines; organizational learning is a dynamic process that evolves gradually, incrementally and in a path-dependent nature; and organizational learning can negatively impact organizational performance when it is misapplied to inappropriate situations. I will now review each of these propositions in turn.

Organizational learning is the accumulation of a firm's past inferences, which are stored in its routines, that then structure the firm's actions (Cyert & March, 1963; Nelson & Winter, 1982; Levitt & March, 1988; March & Simon, 1958). When the firm detects a situation that it believes is repetitive based upon its former experiences, the firm can act quickly and reliably with a designated pattern of behavior. Routines provide a type of "mental short cut" to the firm, by allowing it to engage in behavior without having to go through full deliberation. Thus, routines serve as a special tool to the firm by providing a way for it to efficiently

structure its knowledge, effectively retrieve it, and avoid potential cognitive overload. As Levitt and March explain:

> "…organizations are seen as learning by encoding inferences from history into routines that guide behavior. The generic term "routines" includes the forms, rules, procedures, conventions, strategies, and technologies around which organizations are constructed and through which they operate. It also includes the structure of beliefs, frameworks, paradigms, codes, cultures, and knowledge that buttress, elaborate, and contradict the formal routines. Routines are independent of the individual actors who execute them and are capable of surviving considerable turnover in individual actors" (Levitt & March, 1988, p.517)

Thus, the organization's routines provide the firm with a useful way to apply its growing stock of knowledge through actions that are familiar, speedy and reliable.

Similar to the idea of the relationship between a firm's learning and its routines, researchers have built on this notion with the concept of the dominant logic (Prahalad & Bettis, 1986). A dominant logic is created through "managers' interpretations of experiences while operating in certain firms and industries", that are then translated into a general "mind set or world view or conceptualization of the business and the administrative tools to accomplish goals and make decisions in that business…stored in a shared cognitive map (or set of schemas) among the dominant coalition…expressed as a learned, problem-solving behavior" (Prahalad & Bettis, 1986, p.489, 491). The concept of a dominant logic strongly resembles our discussion above regarding organizational routines; both allow an organization

to assess a situation and speedily apply a reliable and familiar action plan, thereby avoiding a potential cognitive backlog.

Organizational learning is a dynamic process that evolves gradually and incrementally (Lindblom, 1959; Cyert & March, 1963; Allison, 1971; Nelson & Winter, 1982; Levitt & March, 1988; Teece, 1984; Dosi, 1988). As a firm gains new understanding and insights from its direct experiences, it can alter its routines and beliefs to reflect these (Levitt & March, 1988). However, this is a gradual process in that organizational rules and routines are difficult to change and persist over time (Stinchcombe, 1965; Hannan & Freeman, 1977; Cohen & Bacdayan, 1994). The literature has identified three characteristics of organizational routines make them hard to redesign: because routines are embodied in multi-actors, perpetually emergent, and hard to articulate, they are difficult for an organization to grasp, subsequently making modification challenging (Cohen & Bacdayan, 1994).

Nevertheless, the literature has identified two mechanisms that can help to alter a firm's routines, include trial and error experiments and organizational search (Levitt & March, 1988). The notion of trial and error learning implies that if an organization's routine is providing the firm with success in achieving its goals, its use will be increased; on the flip side, if the routine is not performing in a satisfactorily way, its use will be decreased (Cyert & March, 1963).[1] This learning response is also confirmed by work in psychology in the behavioral learning

[1] I recognize that Cyert & March (1963) used the term standard operating procedures in place of routines. However, I believe the terms are synonymous here in their intended use.

theory, which also argues that behavior that is rewarded will persist, while behavior that is punished will lessen and change (Skinner, 1953; Schwartz, 1978; Haleblian & Finkelstein, 1999). If a firm engages in organizational search for potential alternatives, one would expect the firm to search locally and thereby select choices in the neighborhood of its current choices, as Nelson & Winter (1982) explain:

> "…a firm that is already successful in a given activity is a particularly good candidate for being successful with new capacity of the same sort. The replication assumption in evolutionary models is intended primarily to reflect the advantages that favor the going concern attempting to do more of the same, as contrasted with the difficulties that it would encounter in doing something else or that others would encounter in trying to copy its success…in replicating an existing routine, the firm seeks to impose that routine's order on an entire new set of specific inputs. That task is a magnified version of one for which it already possesses routinized arrangements." (Nelson & Winter, 1982, p.119)

Regardless of which mechanism the firm employs to alter its routines, if the organization decides that modifications to its routines are necessary, it will complete them in a way that is gradual.

Organizational learning can negatively impact organizational performance when it is misapplied to inappropriate situations (Prahalad & Bettis, 1986; Cohen & Bacdayan, 1994; Haleblian & Finkelstein, 1999). Although the learning curve perspective predicts positive returns from a firm's experience, it is based on the assumption that the opportunity to reapply the firm's learning and routines is a suitable one. In the same way, the behavioral learning theory argues that

generalization from past experiences to future experiences will lead to positive outcomes as long as the situations are similar (Haleblian & Finkelstein, 1999). Prahalad and Bettis (1986) argue that this notion applies equally well to their concept of a dominant logic, where the application of a dominant logic can benefit the firm only if an element of "strategic similarity" exists between its existing businesses (from which the firm's dominant logic was formed) and the one the firm is targeting. In light of the reality that a dominant logic can be misapplied, the authors suggests that the similarity/relatedness notion be formally extended by "develop(ing) a concept of relatedness based on 'strategic similarities' of businesses and the cognitive composition of the top management team…in other words, relatedness may be as much a cognitive concept as it is an economic and technical concept (Prahalad & Bettis, 1986, p.499).

Constructive examples of how an organization can misapply its learning from past experiences, and inappropriately generalize by firing off routines into completely wrong circumstances is described by Allison (1971), on how the Soviet Union compromised their performance during the Cuban Missile Crisis:

> "…though they had made considerable efforts to disguise their identity…troops did not wear uniforms but rather appeared in slacks and sport shirts…(yet, troops) who arrived in civilian clothes at Cuban docks formed in ranks of fours and moved out in truck convoys…in an even more startling signal… Soviet units did decorate the area in front of their barracks with standard Soviet ground force insignia representing both infantry and armor forces, elite guard badges, and even a Red Army Star" (Allison, 1971, p.109).

Thus, a firm's learning can allow it to respond to similar situations with speedy and reliable action. However, if the firm's learning is inappropriately applied to a situation, it can negatively impact the firm's performance. Researchers have concluded, "routines are like a two-edged sword…they allow efficient coordinated action, but also introduce the risk of highly inappropriate responses" (Cohen & Bacdayan, 1994, p.405).

Empirical Research

Empirical work on patterns of corporate entry and exit using organizational learning and evolutionary theory is rare. Most empirical efforts in this direction can be found within the IO/SCP or RBV camps, as reviewed in the sections above. One of the reasons why empirical work using the OL/EE perspectives is scarce is due to the difficulty in obtaining empirical measures for the constructs. However, though very little empirical work on OL/EE exists, the significance of the efforts that have been made easily make up for the lack of volume. For instance, the ground-breaking work by Helfat (1994) provides empirical support for the OL/EE concepts of cumulative learning and path dependency, as well as the mechanisms of gradual learning and incremental change. Investigating the R&D activities of firms in the petroleum industry, Helfat (1994) creatively devises a way to empirically tap into many of the hard to grasp constructs of OL/EE. She finds support for the ideas that: firm differences do exist; learning is gradual,

incremental, path-dependent, cumulative and often tacit; and, firms search locally. She concludes that her results have significant strategic implications in that "these slow-to-change differential firm capabilities can produce persistent differences in firms' performance (Helfat, 1994, p.1745).

More researchers have begun to try to surmount the empirical difficulties and use the OL/EE perspectives in studies regarding firm scope decisions because these perspectives allow a dynamic view of the phenomenon. Attention to this point was highlighted in a piece by Ramanujam & Varadarajan (1989), where the authors concluded, after a comprehensive review of the diversification literature, that there is a great need to "shift the focus of analysis… to *cumulative* diversification experiences" (Ramanujam & Varadarajan, 1989, p.544). Researchers have responded to their call with studies that employ these theories and use longitudinal analysis. For instance, Amburgey & Miner (1992) investigated strategic momentum and merger activity over a 29-year period drawing on organizational learning theory's concepts of routines, competencies, and accumulated experience. After examining a firm's strategic decisions over time, they conclude that a firm's experience does matter, and it impacts the firm's future actions (Amburgey & Miner, 1992).

Similarly, Pennings, Barkema and Douma (1994) examined the relationship between organizational learning and corporate diversification using the dissolution of 462 expansions by Dutch firms. The authors find support for lateral

organizational learning, where a firm's expansions are successful when they are relatively close to the firm's current skills. Results on longitudinal learning, where the firm gains knowledge just from the magnitude of its expansion activities, were not as robust as the results on lateral learning but had a strong relationship with time; thus supporting the proposition that the "accumulation of experiences takes time" (Pennings, Barkema and Douma; 1994, p.632). The authors conclude that their results support both of the organizational learning arguments that firms will fare better in activities that draw on their previous learning and that "success breeds success"; where firms that have succeeded before are more likely to replicate their success in the future due to learning (Pennings, Barkema and Douma, 1994).

Kim & Kogut (1996) investigate the relationship between a firm's technological experience and corporate diversification in hyper-competitive markets. The authors find support for their idea that a firm's experience in "platform" technologies (technologies that have wider technological and market opportunities) affects both the direction and temporal sequence of their subsequent entry choices (Kim & Kogut, 1996). The authors make the unique argument that just as a core technology follows a technology trajectory, where it evolves and branches, so too does a firm that has proprietary experience in a platform technology. Thus, the authors examine a firm's capabilities as "platforms", and discover that the temporal sequence of a firm's diversification strategy is

contingent upon market opportunities as well as the technological history of the individual firm (Kim & Kogut, 1996).

In the only piece to my knowledge that investigates corporate evolution comprehensively by examining a firm's entries *and* exits over time using the OL/EE perspectives is a piece by Chang (1996). In this work, he makes the argument that firms engage in continuous search and selection through entry and exit activities in order to improve their knowledge base and performance. He finds that a firm's knowledge base is linked to what businesses an organization will enter and exit, where the firm's knowledge base is measured through its human resource profile. Thus, this important finding supports the concepts of path-dependency and that an organization will adjust its actions based on the feedback it receives from its experiences therefore becoming more focused and directed over time (Chang, 1996). His paper takes an important first step in using OL/EE to further our understanding of corporate evolution.

Turning now to empirical studies that investigate whether organizational learning can negatively impact organizational performance when it is misapplied to inappropriate situations, Cohen & Bacdayan (1994) have conducted interesting work in this arena. Using a laboratory experiment, the authors induce behavioral patterns from subjects that strongly resemble routines (consequently supporting the existence of routines) as a way to try and tap into procedural knowledge, as opposed to declarative knowledge. The authors find evidence that individuals store

routines in their procedural memory and that certain manipulations can trigger *both* appropriate and inappropriate behaviors. Their work has important implications for how we can understand the dynamics of routines, specifically how routines can arise, trigger behaviors and change. In addition, the work by Haleblian & Finkelstein (1999) investigates the relationship between acquisition experience and acquisition performance and finds a curious U-shaped relationship. They argue that their findings suggest that inexperienced acquirers have a tendency to inappropriately generalize from their acquisition experience to future dissimilar acquisitions, while more experienced acquirers appropriately discriminate between their acquisitions. Altogether, these studies highlight the important lesson that learning does not always result in positive organizational performance and breathes new life into the expression "a little knowledge is a dangerous thing."

Conclusion

The OL/EE perspectives indicate that: (1) organizational learning is the accumulation of past inferences, stored in routines, (2) organizational learning is a dynamic process that evolves gradually and incrementally, and (3) organizational learning can negatively impact organizational performance when it is misapplied to inappropriate situations. From my empirical review, I note that researchers have established: (1) that even though it is not the focus of this line of research, industry/market structure factors have been included, even as controls, indicating

that like researchers in the IO/SCP and RBV traditions, OL/EE researchers also recognize market structure factors as being important (Amburgey & Miner, 1992; Pennings, Barkema and Douma, 1994; Kim & Kogut, 1996; Chang, 1996; Haleblian & Finkelstein, 1999), (2) the view that relatedness/similarity is an important issue with respect to scope choices is reinforced by work in this tradition, though it is approached in a different way theoretically as the smooth functioning of routines, cumulative learning, and path dependency (Helfat, 1994; Amburgey & Miner, 1992; Pennings, Barkema and Douma, 1994; Kim & Kogut, 1996; Chang, 1996), (3) an organization's *prior* experiences and learning affects its *future* experiences and learning (Helfat, 1994; Amburgey & Miner, 1992; Pennings, Barkema and Douma, 1994; Kim & Kogut, 1996; Chang, 1996; Haleblian & Finkelstein, 1999), (4) a firm can misapply its learning to inappropriate situations and subsequently hurt its performance (Cohen & Bacdayan, 1994; Haleblian & Finkelstein, 1999). This notion can possibly start to explain why it is that all related diversifiers do not excel (Bettis & Mahajan, 1985); and, (5) although this work launches a more dynamic view onto the phenomena of corporate evolution through learning, the OL/EE perspectives neglect to investigate the *context* in which that firm came to know these things. The strategic decision-making literature argues that different environmental contexts require different decision-making processes, which lead to different choices. Noting that this logic could

potentially impact corporate evolution, I now turn to the strategic decision-making literature.

2.2.2 Strategic Decision-Making Perspective

Researchers have concluded that a firm's ability to use a particular type of strategic decision-making process depends heavily on the context, of which the environment is a critical factor (Carter, 1971; Anderson & Paine, 1975; Nutt, 1976; Bourgeois, 1980; Miller & Friesen, 1983; Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Priem, Rasheed, & Kotulic, 1995). The environment can confront organizations with varying dimension levels of munificence, dynamism, and complexity, affecting their ability to conduct a particular strategic decision-making process (Thompson, 1967; Anderson & Paine, 1975; Nutt, 1976; Miller & Friesen, 1983; Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Priem, Rasheed, & Kotulic, 1995). These three environmental dimensions are not the only ones that have been linked to strategic decision-making processes, however they embody the dimensions that are the most widely identified and used in the literature (Emery & Trist, 1965; Terreberry, 1968; Dill, 1958; Duncan, 1972; Tosi, Aldag, & Storey, 1973; Jurkovich, 1974; Tung, 1979; Dess & Beard, 1984). Failure to consider

variations in the environment across these dimensions may lead to poor decision-making effectiveness (Dean & Sharfman, 1996) or subsequent performance (Miller & Friesen, 1983; Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Priem, Rasheed, & Kotulic, 1995).

Different environments pose different cognitive challenges on a firm, causing the organization to employ different decision-making processes, which lead to different choices. Strategic decision-making is a complicated process, characterized by intense complexity, ambiguity and lack of structure (Schwenk, 1984). Decision-makers can easily become overwhelmed by the bombardment of information to consider, for they "cannot simultaneously consider or process all the variables and data involved in a decision as complex as acquisition or divestment" (Duhaime & Schwenk, 1985, p.287). The mental roadblock that the decision-makers hit is referred to as bounded rationality in the literature. Bounded rationality recognizes that there are cognitive limitations on the decision-makers, making them unable to handle all of the available, potentially ambiguous information (Simon,1955, 1976; Cyert & March, 1963).

In an effort to try and reduce the uncertainty and information overload, decision-makers will use simplification processes, heuristics or mental models to complete their cognitive tasks (Simon, 1955, 1976; March & Simon, 1958; Cyert & March, 1963; Kiesler & Sproull, 1982). Though simplification processes can help

decision makers manage their cognitive undertaking, these processes can also introduce bias. Tversky & Kahneman explain, "in general, these heuristics are quite useful, but sometimes they lead to severe and systematic errors" (Tversky & Kahneman, 1974, p.1124). Researchers have hypothesized about the potential cognitive biases that may arise from acquisition and divestment decisions; they have included reasoning by analogy, illusion of control, escalating commitment, and single outcome calculation (Duhaime & Schwenk, 1985).

The literature identifies several strategic decision-making processes, but a select two have received the most attention (Mintzberg, 1978; Fredrickson, 1984; Fredrickson & Mitchell, 1984; Bourgeois & Eisenhardt, 1988; Fredrickson & Iaquinto, 1989; Priem, Rasheed, & Kotulic, 1995). The synoptic process (Andrews, 1971; Ansoff, 1965; Hofer & Schendel, 1978) and the incremental process (Lindblom, 1959, 1979; Cyert & March, 1963; Mintzberg, 1973; Quinn, 1978, 1980) have dominated the strategic decision-making literature. The two processes represent opposite ends on a continuum, where the synoptic process is highly rational and comprehensive in that decision-makers: list out all objectives, values, criteria to fulfill these objectives, and potential alternatives; conduct complete comparisons; and make strong use of theory in selecting their final choice (Lindblom, 1959). In contrast, the incremental process is one where decision-makers: set out a primary objective and a few other goals; record some alternatives; compare the choices, but without an emphasis on theory; look at past records of

their incremental steps; and achieve partial goals, while repeating these steps over time (Lindblom, 1959). These two strategic decision-making processes make it easy to see how different processes can lead decision-makers to select different choices.

Empirical research

Fredrickson pioneered empirical investigations linking a firm's environment to the rationality of its strategic decision-making process and performance (Fredrickson, 1984, Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989). Fredrickson reasoned that a firm will chose to act rationally, and this subsequently indicates that the organization will chose a synoptic decision-making process. However, certain environments introduce high levels of uncertainty, threatening the firm's ability to act rationally and comprehensively. Fredrickson defines comprehensiveness as the "the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions" (Fredrickson & Mitchell, 1984, p.402). In his path breaking work, he finds that the comprehensiveness of a strategic decision-making process is negatively related to the firm's performance in an unstable industry (Fredrickson & Mitchell, 1984) and positively related to the firm's performance in a stable industry (Fredrickson, 1984). In a follow-up study five years later, he reinforces his original results longitudinally (Fredrickson & Iaquinto, 1989).

In the opposite direction, a theoretical and empirical case has been made that in high-velocity environments, comprehensiveness in decision-making processes will result in positive firm performance (Eisenhardt, 1989). Eisenhardt presents a complex perspective on cognition, and argues that in dynamic environments decision-makers "kick up" their mental abilities and speed along through processing more information, alternatives, and comparisons through advice-seeking (Eisenhardt, 1989). Similarly, Glick, Miller & Huber (1993) also find that comprehensiveness in the strategic decision-making process positively related to performance in firms in dynamic environments.

Though these two sets of studies show contradictory results, together they clearly indicate that different environments cause organizations to employ different strategic decision-making processes, which lead to different performance outcomes. Extending this important line of research, Dean & Sharfman (1996) achieve an excellent empirical contribution with their work linking strategic decision-making, environment and decision effectiveness (instead of firm performance). Their results indicate that decision-making processes and environment are undeniably related to decision success.

Conclusion

The strategic decision-making literature indicates that: (1) researchers have also concluded that a firm's inclination to successfully use a particular type of

strategic decision-making process depends heavily on the context, of which the environment is a critical factor (Carter, 1971; Anderson & Paine, 1975; Nutt, 1976; Bourgeois, 1980; Miller & Friesen, 1983; Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Priem, Rasheed, & Kotulic, 1995); (2) strategic decision-making is a complicated process, characterized by intense complexity, ambiguity and lack of structure (Schwenk, 1984); and, (3) in an effort to try and reduce the uncertainty and information overload, decision makers will use simplification processes, heuristics or mental models to complete their cognitive tasks (Simon, 1955, 1976; March & Simon, 1958; Cyert & March, 1963; Kiesler & Sproull, 1982). From my empirical review, I note that researchers have established: (1) that different environments pose different cognitive challenges on a firm, causing the organization to employ different decision-making processes, triggering different heuristics and mental maps, which lead to different choices and performance outcomes (Fredrickson, 1984, Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989; Eisenhardt, 1989; Glick, Miller & Huber, 1993; Dean & Sharfman, 1996.

From this literature review, I conclude that a potential scope choice may be related in a product-market sense (content) to a firm's existing businesses, yet it may nevertheless have very different environmental dimensions (context). Thus, it is important to consider the characteristics of the industry environment and not just

product-market matters in entry and exit decisions. Yet, prior research has not examined this at all. I intend to address this significant gap and provide new and important insights to our understanding of corporate evolution.

3 Hypotheses

This section presents the main hypotheses of the study. I contend that the literature's notion of experience, with respect to a firm learning from its own experience, can be broken down into two concepts (product-market and environmental experiences), and claim that these different types of experiences can generate different learning capabilities for the organization. In developing the hypotheses, I build upon the resource-based view, organizational learning, evolutionary economics, and strategic decision-making literatures.

For clarity, the following definitions are used. First, I distinguish between two types of organizational experiences (product-market and environmental experiences), which lead to two types of learning: product-market learning and environmental learning. I suggest that product-market learning is the accumulation of the concrete "know what" and hard facts derived from a firm's experiences in a given set of product-markets. This idea of acquiring the *substantive* knowledge of a business can be extended beyond product-markets (where I focus), and can include the "content" learning gained from a firm's experiences in terms of technologies, distribution channels, scientific research and production processes. For instance, knowledge of the semi-conductor technologies used in the microprocessor industry qualifies as an example of a firm accumulating concrete "know what" in terms of technologies. Likewise, two chemical businesses that

share a common knowledge and research arena in organic chemistry also illustrates an example of "content" learning in scientific research.

Environmental learning is defined as the firm's accumulation of the elusive "know how" knowledge gained from its experiences managing businesses in different decision-making environments. Environments can vary along different dimensions and three have continued to stand out in the literature, including munificence, complexity and dynamism (Emery & Trist, 1965; Terreberry, 1968; Dess & Beard, 1984). Environmental learning taps into the notion of the dominant logic, defined as a way of thinking or managing in a given business (Prahalad & Bettis, 1986). For instance, understanding "how to manage" in the dynamic microprocessor business constitutes an example of environmental learning.

Second, a firm's scope decision is defined as any strategic business unit diversification/entry or divestment/exit by the organization. For instance, if a firm adds a new business, it changes its scope.

In the following hypotheses I link the firm's scope choices, entry and exit, to two main determinants: product-market relatedness and environmental relatedness.

3.1 Direction of entry

3.1.1 Hypothesis 1 – Product-market relatedness and entry

Received research suggests that firms are heterogeneous with respect to their resources and capabilities (Penrose, 1959; Wernerfelt, 1984; Barney, 1991). A firm's resources can be tangible, such as plants, land and equipment, or intangible, such as technological skills, brand equity, or corporate culture. Researchers have argued that a firm's resources can also include its special knowledge, which is created over time through the experiences that the people in the firm have interfacing with each other and the firm's tangible and intangible resources (Penrose, 1959). Altogether, a firm's resources remain dynamic and unique from its personnel creating a constant interaction among its special knowledge, capabilities and resources.

These interactions cause the firm to be in a continual state of flux, where its resources and capabilities are repeatedly out of balance and suffer from unused capacity. A natural solution for the firm to resolve the tension created by its inoperative resources is to keep finding *new* uses for them. Penrose explains this mechanism, where:

> "many of the productive services created through an increase in knowledge that occurs as a result of experience gained in the operation of the firm as time passes will remain unused if the firm fails to expand. Thus they

> provide an internal inducement to expansion as well as new possibilities for it" (Penrose, 1959, p.54)

Thus, related diversified expansion will help the firm to more fully utilize its resources and secure a more balanced internal situation.

The Penrosian hypothesis suggests that a firm will expand in a direction similar to its present resources so that it can take advantage of its existing links to expand its base and strengthen its competitive position (Penrose, 1959). More specifically, a firm will select an entry choice where it can transfer its distinctive resources and capabilities, thereby allowing it to build and maintain a competitive advantage in the new business (Porter, 1987). By the firm sharing its superior resources across its businesses it creates more opportunities for itself to uncover potential synergies, resulting in the firm's resources accruing more value and expanding its resource pool through new combinations of resources (Porter, 1985; 1987). Thus, a firm's current resources will dictate the direction of the firm's expansion efforts (Penrose, 1959).

Though an organization's resources can be partitioned up into extensive detail, researchers have recognized a firm's physical resources as one of its most important dimensions (Penrose, 1959; Gort, 1962; Chandler, 1962; Rumelt, 1974; Teece, 1982). A firm's physical resources include its raw materials, plant, equipment, land and natural resources. When a firm's target business is in a direction that is related to the physical resources of its current businesses the propinquity between the businesses allows for "similar or complementary uses of

products, similar production processes, and the use of common raw materials for the products…in short, it concerns relations between the physical characteristics of products" (Gort, 1962, p.57). Focusing in on a firm's relations between the physical characteristics of its products between its businesses is also known as a "product-market" perspective; it is a *more refined dimension* of a firm's resources, derived from the broader physical resource dimension.

Researchers have theorized how companies have selected scope choices based upon the efficiencies gained through product-market relatedness. For instance, Chandler described how industrial chemical companies engaged in related diversification based upon product-market similarities to tap into the economies of scale and scope, and how this type of expansion can mushroom into even greater company-wide synergies:

> "Increasingly, however, economies of scope within the enterprise as a whole provided an even stronger dynamic for growth. One division was able to use intermediate products produced or developed in others, to exploit research and development information and techniques perfected in other divisions, to apply knowledge acquired in other divisions that used comparable production technologies or served similar markets. Most important of all, the top and middle managers of these enterprises were able to use their experience and skill in deciding on products to be developed, in making the initial investment in production facilities of the proper size, in creating a new marketing network, and in recruiting the management teams essential to achieve and maintain first-mover advantages for their new products. And the continuing product development and commercialization further improved the facilities and honed the skills that constituted

> the organizational capabilities of the enterprise as a whole" (Chandler, 1990 edition, p.188).

Thus, a strong case has been made for the significance of product-market relatedness as an important dimension of a firm's resources.

If resource-based arguments are to predict the direction of diversification, then it is likely that firms will enter those markets that have a physical relatedness to their existing products so that they can utilize their excess resources to the greatest possible extent (Montgomery and Hariharan, 1991; Chatterjee and Wernerfelt, 1991). Thus, product-market relatedness to their existing product portfolio is likely to be a significant attractor for firms seeking to enter new industries. Based on the above arguments I suggest the following base hypothesis:

> **H1.** *The closer the host and target industries are in terms of product-market relatedness, the greater the likelihood that the firm will enter that industry.*

3.1.2 Hypothesis 2 – Environmental relatedness and entry

Within the strategic decision-making literature, it has been argued that different environments place different cognitive challenges on a firm, causing the organization to employ different decision-making processes. The fit between a firm's environment and its decision-making processes is an important issue, for research has shown that it can impact a firm's subsequent decision effectiveness

and performance (Dill, 1958; Duncan, 1972; Dean & Sharfman, 1996; Fredrickson & Mitchell, 1984; Fredrickson, 1984; Fredrickson & Iaquinto, 1989; Eisenhardt, 1989). Therefore, a firm needs to recognize the environmental conditions and make use of the most appropriate decision-making process for that particular environment.

Environments can vary along different dimensions. Though many dimensions have been identified by researchers, three have continued to stand out in the literature, including munificence, complexity, and dynamism (Emery & Trist, 1965; Terreberry, 1968; Dill, 1958; Duncan, 1972; Tosi, Aldag, & Storey, 1973; Jurkovich, 1974; Tung, 1979; Dess & Beard, 1984). Environmental munificence refers to the ability of the environment to support sustained growth (Starbuck, 1976; Dess & Beard, 1984). Environmental complexity refers to "the heterogeneity of and range of an organization's activities" (Child, 1972, p.3). Environmental dynamism taps into the level of unpredictable turbulence in the environment, where higher levels of unpredictable turbulence generate more uncertainty and instability in the environment (Emery & Trist, 1965; Duncan, 1972; Jurkovich, 1974; Dess & Beard, 1984). Extensive objective measures of these three environmental dimensions have been successfully identified in the literature (Dess & Beard, 1984).

A decision-making process that is useful in one context may be less useful in another. For instance, if an organization is used to managing its businesses in

environments that have low levels of turbulence, the organization may use its stable and predictable situation to employ a high level of comprehensiveness in its decision-making processes (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Fredrickson & Iaquinto, 1989). If the firm enters a new business that has a significantly higher level of turbulence, a comprehensive decision-making process may be inappropriate in this new situation, and could hurt the firm's performance (Fredrickson & Mitchell, 1984). Or the firm may need to modify its comprehensive decision-making processes, where in high velocity environments, it learns how to quickly speed along through the barrage of information and advice seeking to better adjust and compensate to the higher levels of turbulence (Eisenhardt, 1989).

When seeking to expand to more fully utilize its resources and secure a more balanced internal situation, firms would like to enter businesses that are similar in product-market (as per Hypothesis One). Additionally, target businesses with environments that would match with the existing management decision-making processes of the firm would be especially attractive as a way to utilize the unused capacity of administrative talent in the firm. Though researchers have acknowledged the role that management plays in trying to make the best use of the firm's resources, they often forget the importance of management as a resource. As Penrose explains, "the experience of management will affect the productive services that all its other resources are capable of rendering" (Penrose, 1959, p.5).

Thus, the management teams' environmental exposure has directly shaped their decision-making processes and subsequent choices, and this can be seen as an important *yet overlooked* component to the scope selection process.

For instance, a potential scope selection may share a lot of product-market similarities with the firm's existing businesses, such as similar inputs, manufacturing processes, and distribution channels. However, it is imperative that the firm *also* evaluate the potential scope selection in terms of environmental similarities with the firm's existing businesses; this includes what environmental contexts the target business brings with it, in terms of the three environmental dimensions of munificence, dynamism and complexity. If the firm is targeting a scope selection that offers an environment that the firm has not had previous experience with or where the firm has not been successful in, it may be selecting a mismatched choice. The different environment of the target business may require the firm to learn and develop new strategic decision-making processes, routines and mental models in order to successful manage the new business. Similarly, if there is a close fit between the environment of the potential scope selection and the environments of the firm's existing businesses, the target business will be an attractive entry candidate.

Hypothesis One focused on the product-market aspects of resources that might explain diversification entry. However, ideally a firm would like to expand into markets where all of its resources could be used, including the environmental

knowledge embodied in its management team regarding specific environments. My process argument absorbs and builds upon Prahalad and Bettis's dominant logic argument, and it is my hope that my claim will empirically validate their conclusion that "relatedness may be as much a cognitive concept as it is economic and technical" (Prahalad & Bettis, 1986, p.499). I predict that the firm will be influenced to select choices that complement the learning it acquired from its previous experiences, resulting in the firm's experiences being environmentally related.

Based on the above analysis, the following relationship is suggested:

> **H2.** *The closer the host and target industries are in terms of environmental relatedness, the greater the likelihood that the firm will enter that industry.*

3.1.3 Hypothesis 3 – Product-market and environmental relatedness and entry

I claim that a potential scope choice needs to be evaluated against a firm's past experiences in terms of *both* product-market learning and environmental learning. A target business can differ from a firm's existing businesses along two approaches. First, the product-market knowledge of a firm's experiences may differ with what is required to successfully compete in the new potential selection.

Second, the environment of the potential scope choice can be different in terms of munificence, dynamism, and complexity. Firms should assess a potential scope choice for relatedness in both product-market and environmental areas to ensure the appropriate application of its prior learning. For instance, mainframe computers and personal computers may both require an understanding of the same computing technology and manufacturing processes (product-market learning). Yet, the actual competitive environment in these two industries may be widely different and may demand very distinct organizational decision-making processes, routines, and dominant logics (environmental learning). To give another example in the opposite direction, pharmaceutical and chemical firms compete in a similar dynamic environment (environmental learning). However, the distribution channels, products and technologies used are very different (product-market learning).

Thus, even though firms that have participated in a business may have a good understanding of the product-market knowledge required for the target business, without an understanding of the environmental know how required (or vice versa) to compete in the new business in terms of decision-making processes and mental models, an expansion into such new businesses would not be the best suited match for the firms. Thus, in order to best leverage its learning, the firm will select choices that are related in both product-market and environmental learning. This suggests the following hypothesis:

H3. *Product-market and environmental relatedness, together, will have the strongest influence on the direction of a firm's entry choices.*

3.1.4 Hypothesis 4 – Focus on product-market in entry

While I argue that the relatedness in both types of learning is important to the success of a firm's business addition and development efforts, I propose that managers are more likely to focus on product-market issues in deciding the direction of diversification rather than the environmental aspects of this set of decisions. In other words, managers are more likely to ignore environmental unrelatedness than product-market unrelatedness. The literatures on strategic issues and acquisition process specifically, and the strategy literature more generally, suggest this primacy of "content issues" over "process issues" in the context of many firm decisions. For instance, in the strategy literature, diversification and divestment issues have primarily been considered part of the territory of the strategy content camp and the resultant literature has focused largely on the content aspects of relatedness in products and markets (Ramanujam and Varadarajan, 1989).

From a managerial decision-making perspective too, acquisitions and divestitures are more likely to be evaluated in terms of strategy content and financial analysis, than with respect to the actual strategic process and process

related issues for at least two reasons (Haspeslagh & Jemison, 1991; Jemison and Sitkin, 1986). First, managers may fail to recognize the importance of process issues, as such issues may not be easily quantifiable or cognitively salient. Research in strategic issue diagnosis and cognition has noted that certain issues are likely to be perceived as "top of the head phenomena" that merit immediate and complete attention (Cowan, 1986; Dutton, Stumpf and Wagner, 1990; Taylor and Fiske, 1978). Resources devoted to considering problems are related to the perceived salience of the problem (Dutton, Stumpf and Wagner, 1990). Second, even when managers recognize the importance of the organizational or process elements of a business expansion decision, the very process of analyzing, negotiating with and acquiring another firm may prevent detailed consideration of these process elements (Jemison and Sitkin, 1986). For these reasons I suggest:

> **H4.** *Firms are more likely to focus on product-market issues than environmental issues. Therefore product-market relatedness will have a stronger influence on the direction of a firm's entry choices than environmental relatedness.*

3.2 Direction of exit

3.2.1 Hypothesis 5 – Product-market relatedness and exit

As mentioned in section 3.1.1, a firm's pool of resources will dictate the direction of its future scope choices. I argue in this section that a firm's underutilized resources and capabilities will also drive a firm's exit choices. Two sets of arguments suggest that businesses in product markets that are most distant from the firm's resource profile will be exited earliest. The first argument relates to the notion of the firm's pool of resources. Since a firm's pool of resources is ever evolving, this can lead to the condition where some of a firm's past selections will not always match with where the firm's pool of resources is directing the firm to go to today. Since these past selections are in areas most distant from the firm's current pool, they can contribute the least to it. When a firm's past scope choices do not utilize the firm's current pool of resources, the organization can no longer gain efficiency benefits from them. Further, keeping these past selections up and running may demand the most attention since they are in areas that are not an easy fit with the rest of the firm, turning these past selections into resource drains rather than resource generators. Thus, firms would prefer to exit from these *now* unrelated choices. Second, businesses that are most distant from a firm's resource profile are likely to see the negative effects of unrelated diversification earlier. Poor performance in these units will draw attention to them and motivate a reconsideration of their place in the overall portfolio of the firm.

This leads to the following hypothesis:

H5. *The farther the host and target industries are in terms of product-market relatedness, the greater the likelihood that the firm will exit that industry.*

3.2.2 Hypothesis 6 – Environmental relatedness and exit

Just as it is important that the firm's businesses are related in terms of product-market knowledge in order for it to gain efficiency benefits, so too should there be a match among its businesses in terms of environmental knowledge. If a business requires knowledge that is different from the environmental knowledge embodied in the firm's dominant logic, the firm will not be successful in managing that business. As Prahalad and Bettis explain:

> "The ability of a top management group (a group of key individuals), to manage a diversified firm is limited by the dominant general management logic(s) that they are used to. In other words, the repertoire of tools that top managers use to identify, define, and make strategic decisions, and their view of the world (mind sets), is determined by their experiences" (Prahalad & Bettis, 1986, p.490).

Poor performance will trigger a firm into "search mode" for answers on how to solve this problem. Unfortunately, just as the firm's dominant logic helps it to function by avoiding cognitive overload, it also determines what information the organization will pay attention to, how it will interpret that information, and will limit the range of solutions it will identify (Cyert & March, 1963; Duhaime &

Schwenk, 1985; Prahalad & Bettis, 1986; Barr, Stimpert & Huff, 1992). Thus, altering a firm's dominant logic or having the firm add on an entirely new one is quite a challenge for the organization. Furthermore, having the firm try to accomplish this under performance pressures from the environmentally unrelated business only compounds the undertaking. If a firm cannot successfully "turn the business around" by gaining this new learning, it will divest it (Prahalad & Bettis, 1986). As a result, similarity among a firm's businesses with respect to environmental knowledge is also important.

This leads to the following hypothesis:

> **H6.** *The farther the host and target industries are in terms of environmental relatedness, the greater the likelihood that the firm will exit that industry.*

3.2.3 Hypothesis 7 – Product-market and environmental relatedness and exit

As I mentioned in section 3.2.2, environmental unrelatedness is amorphous and difficult to recognize due to the fact that the firm is already operating under a dominant logic (or logics) that determines what information the organization will pay attention to, how it will interpret that information, and will limit the range of solutions it will identify (Cyert & March, 1963; Duhaime & Schwenk, 1985; Prahalad & Bettis, 1986; Barr, Stimpert & Huff, 1992). Combining this with the

acknowledgment that product-market issues have more salience over environmental issues among managers because of the increased visibility through strategic management books, consulting firms, and the popular business press, product-market unrelated scope candidates are the more obvious choices for managers to axe. In contrast product-market unrelatedness is more visible and obvious – recognizing that product-markets bear little relationship to each other is generally more obvious than recognizing the subtler differences that environmental unrelatedness entails.

All of a firm's businesses will fall into one of four possible combinations of product-market and environmental unrelatedness. Businesses can be related in both product-market and environment, unrelated in both product-market and environment, related in product-market but unrelated in environment, related in environment but unrelated in product-market. Businesses that are unrelated in both product-market and environment are likely to see the worst possible performance. These businesses will be divested the earliest. Businesses that are related in both product-market and environment can generally be expected to perform the best. Such businesses are also likely to be regarded as the core of the company (Gort, 1962) and least likely to be divested. Businesses that are environmentally related but product-market unrelated and product-market related but environmentally unrelated are likely to lie between these two extremes. Specifically, businesses that are product-market unrelated and environmentally related, will be divested before

businesses that are product-market related but environmentally unrelated, because, as argued before, the salience of product-market issues will cause them to be more easily observed and acted upon. Thus, I hypothesize:

> **H7**. *Firms are more likely to focus on product-market issues than environmental issues. Therefore, they will select exit choices in industries largely based on product-market unrelatedness rather than environmental unrelatedness. Specifically, firms will exit businesses in the following order – (1) product-market unrelated, environmental unrelated, (2) product-market unrelated, environmental related, (3) product-market related, environment unrelated, (4) product-market related, environment related.*

3.2.4 Hypotheses 8 – Relating entry and exit

In my final hypothesis I establish the relationship between business entry and business exit. Each business entry presents the firm with an opportunity to learn about the new business (Chang, 1996). However, such learning is likely to be most significant when the new business shares elements of knowledge with the old business (Cohen and Levinthal, 1990). When firms expand into new businesses but fail to account for the distance between their existing businesses and their new selection, the new entry is more likely to fail. If firms do want to expand from one set of businesses to add a new set of distant businesses the expansion is more likely to be successful if the firm proceeds in a sequential fashion, acquiring businesses

that lie at some distance, but not as far as the targeted businesses, before entering the targeted businesses. More generally, I predict:

> **H8a**. *The smaller the average distance in product-market relatedness between successive entries into businesses, the lower the likelihood of exit.*

> **H8b**. *The smaller the average distance in environmental relatedness between successive entries into businesses, the lower the likelihood of exit.*

Appendix A presents a summary of the hypotheses introduced in this chapter. My eight hypotheses draw from the resource-based view, organizational learning, evolutionary economics, path dependence and strategic decision-making literatures.

4 Methods and measures

This chapter describes the research methods used in the dissertation. The chapter is divided into three sections. The first section describes the data collection and the sample details. In the second section, the variable definitions are presented. The third section specifies the models which will be used in testing the hypotheses, and describes the statistical methods.

4.1 Data collection and sample details

I test the hypotheses on a longitudinal data set of diversified firms competing in multiple industries. Longitudinal data from the study period of 1981 to 1989 allows for the testing of the causal arguments as well as the dynamic aspects of the firm's evolution. This dissertation relies on four major data sources to empirically test the hypotheses: the TRINET historical database, the COMPUSTAT annual industry file, the U.S. Bureau of the Census's *Census of Manufacturers* file and the U.S. Bureau of Economic Analysis's *Input-Output Structure of the U.S. Economy* data set.

The TRINET database is a commercial database that provides information at the establishment level. It is an enormous database, covering 7.5 million establishments of roughly 35,000 companies in the United States. This translates to

about 85% of the national economic activities and virtually all publicly traded companies in the United States. The dataset is available for the years of 1981, 1983, 1985, 1987, and 1989. I use the TRINET database to obtain information on the sales of a firm's businesses in the United States by 4-digit Standard Industrial Classification (SIC) code. I aggregate the establishment-based TRINET information into the 4-digit industry level. Based upon this information, I am able to trace a firm's entry and exit from a business within a 4-digit SIC industry.

The COMPUSTAT annual industry file contains financial data on more than 6,000 companies publicly traded on the NYSE, NASDAQ, and ASE and is compiled from the firms' annual reports and 10-K reports to the Securities and Exchange Commission (SEC). I used the COMPUSTAT database to obtain time-series financial data information on firms' total assets, long-term debt, common equity, current assets, current liabilities, net income, advertising expense, capital expenditures and sales.

The U.S. Bureau of the Census's *Census of Manufacturers* file profiles the manufacturing sector of the US economy, as defined in the Standard Industrial Classification Manual. It is a comprehensive file that includes comparative statistics for industries, states and standard metropolitan statistical areas, collected at the establishment level. The data set is available every five years, for years ending with a "2" or "7". I used the *Census of Manufacturers* file to collect information on the growth, instability and geographical concentration of a

manufacturing industry using one or more of the following: total sales, price-cost margin, total employment, value added by manufacture, and number of manufacturing establishments. This data set also provided information on sales concentration and specialization ratios.

The U.S. Bureau of Economic Analysis's *Input-Output Structure of the U.S. Economy* dataset provides detailed information on the flows of goods and services to industries for the production of gross output. These accounts provide detailed information on the flows of the goods and services that make up the production process of industries. The data set is available every five years, for years ending in a "2" or "7". I used the *Input-Output Structure of the U.S. Economy* tables to collect the information necessary to compose the measures of: concentration of inputs, concentration of outputs, impact of all other industries on the output of a given industry and the relative power of indirectly linked factors on output.

I matched up all of the databases (TRINET, COMPUSTAT, U.S. Bureau of the Census's *Census of Manufacturers*, and the U.S. Bureau of Economic Analysis's *Input-Output Structure of the U.S. Economy*) for my sample of firms. My sample includes only domestic manufacturing companies from the Fortune 250, where a domestic company refers to a firm whose headquarters are located in the United States. This results in a sample size of 106 firms. Firms are identified as manufacturing companies when their main business is reported as manufacturing in the COMPUSTAT database (main SIC code is between 2000 to 3999), as well as in

the Fortune 500 listing. I limit the study to manufacturing firms, at the exclusion of service firms, because the service sector relies on a distinct set of skills and knowledge than manufacturing industries. This makes a comparison between manufacturing and service firms difficult; I thereby avoid such problems.

4.2 Variable definitions and operationalizations

In this section, the variables of the study are discussed. I will first discuss the two dependent variables of the study, entry and exit (4.2.1). Independent and control variables are introduced next (4.2.2 and 4.2.3). The variables of the study are collected for the years 1981, 1983, 1985, 1987 and 1989.

4.2.1 Dependent variables

Entry. The dependent variable in Hypotheses 1,2, 3 and 4 is the probability that firm *k* will enter industry *j*, or P_{kj}. Entry is measured as a 0 or 1 variable, depending on whether or not the firm entered a given industry after 1981.

Exit. The dependent variable in Hypotheses 5,6,7 and 8 is the likelihood that firm *k* will divest one of its businesses in industry *j*, or L_{kj}. Exit is measured as a 0 or 1 variable, depending on whether or not the firm exited a given industry after 1981.

4.2.2 Independent variables

Product-market relatedness. Product-market relatedness is defined as the closeness between the firm's existing industries and the target industry. I incorporate the product-market relatedness variable developed by Sharma & Kesner (1996) and also used by Chang & Singh (1999). It is computed as the sales-weighted concentric diversification index. "Let d_{il} be a weight whose value depends on the distance between the entered industry *i* and the other industries *I* in which the parent has operations. d_{il} has the value of 2 if *i* and *I* are within the same 3-digit SIC code, 1 if *i* and *I* are within the same 2-digit SIC, and 0 if *i* and *I* are in different 2-digit SIC industries. Let P_{kl} be the percentage of firm *k*'s sales that is in industry *I* defined at the 4-digit SIC industry level. The product-market relatedness is defined as $\sum I = 1, \ldots L \ (P_{kl}) d_{il}$. This measure reflects the product-market relatedness between the entrant business and all the other industries in which its parent had operations at the time of the diversifying entry" (Chang & Singh, 1999, p.1027).

Environmental relatedness. To proxy the similarity between the firm's existing and new decision-making environment, I compare the host firm's existing environment with the targeted industry's environment in terms of Dess and Beard's

dimensions of munificence, complexity and dynamism. I was able to obtain information on *20* out of the original 23 measures Dess & Beard had used in their 1984 study to compose each of the three dimensions.

Environmental munificence similarity: I used six measures of this construct based on growth in total sales, growth in price-cost margin, growth in total employment, growth in value added by manufacture, growth in number of manufacturing establishments and sales concentration, respectively. I used the following formula:

Growth in Total Sales Similarity$_i$ $=(GTS_{ij} - GTS_{in})^2$

where GTS_{ij} = Growth in total sales of Target Industry j and GTS_{in}= weighted average of growth in total sales for all industries that firm i is currently active in.

For example, to calculate the measure based on growth in total sales I computed the weighted average level of growth in total sales for the industries the firm is currently participating in (with the proportion of corporate sales in each industry serving as the weights) and I take the difference of this rate from the target industry's growth rate and square it (to capture deviations positive or negative). Similar measures are constructed for growth in price-cost margin, growth in total employment, growth in value added by manufacture, growth in number of manufacturing establishments and sales concentration. These data are obtained from the U.S. Bureau of the Census's *Census of Manufacturers* file.

Environmental complexity similarity: I used eight measures to proxy the degree to which the firm's environment is characterized by homogeneity/heterogeneity and concentration/dispersion (Dess and Beard, 1984). The core idea underlying the Dess and Beard measures is that industries marked by high levels of geographic dispersion and heterogeneity in product offerings are likely to entail more complex decision-making environments. The eight measures include: concentration of inputs; diversity of products; specialization ratio; concentration of outputs; geographical concentration of total sales; geographical concentration of value added by manufactures, geographical concentration of total employment and geographical concentration of industry establishments. For instance, to measure the diversity of products in the industry I use the dollar volume of 7-digit SIC products and compute the Herfindahl index of sales volumes:

Product Diversity = 1-$\sum$ (Sales from i^{th} 7-digit industry / Total sales of the corresponding 4-digit industry)^2

The higher the value of the product diversity index, the more complex the industry. To get the measure of product diversity similarity, which is my proxy for the degree to which the firm's existing and target environments are similar I construct the following variable:

Product Diversity Similarity= $(PD_{ij} - PD_{in})^2$

where PD_{ij} = Product Diversity of Target Industry j and PD_{in} = weighted average of product diversity for all industries that firm i is currently active in. Similar measures are constructed for the other seven variables. These data are obtained U.S. Bureau of the Census's *Census of Manufacturers* and the U.S. Bureau of Economic Analysis's *Input-Output Structure of the U.S. Economy*.

Environmental dynamism similarity: I used six measures of this construct based on the instability in total sales, instability in price-cost margin, instability in total employment, instability in value added by manufacture, impact of all other industries on output of a given industry, and relative power of indirectly linked factors on output. Industries that have high volume instability can be characterized as more dynamic. To measure sales unpredictability I use the coefficient of variation in total industry sales. Again, since my interest is in how the environment is different across the existing and target industries, I compute the following measure of Sales Unpredictability Similarity: $=(SU_{ij} - SU_{in})^2$

where SU_{ij} = Coefficient of Variation in Sales of Target Industry j and SU_{in} = weighted average of Coefficient of Variation in Sales for all industries that firm i is currently active in.

Similar measures are constructed for the other five variables. These data are obtained U.S. Bureau of the Census's *Census of Manufacturers* and the U.S. Bureau of Economic Analysis's *Input-Output Structure of the U.S. Economy*.

Average product-market relatedness between entries. This measure is computed by: (1) taking the target's product-market relatedness score, and (2) summing it with all the other target entries' product-market relatedness scores before it (up to that period), and (3) then dividing that total by the number of entries. This results in a number that reflects the average product-market relatedness between entries. Please see the numerical example below (Table 1).

Average environmental relatedness between entries. This measure is computed by: (1) taking the target's environmental relatedness score, and (2) summing it with all the other target entries' environmental relatedness scores before it (up to that period), and (3) then dividing that total by the number of entries. This results in a number that reflects the average environmental relatedness between entries.

The following numerical example (Table 1) is used to help clarify both of the average relatedness measures. In the following example, I demonstrate how the average environmental relatedness between entries measure is constructed for two firms. The two firms in my example are identified in the first column (**Firm)** – Firm 1 and Firm 2. Column Two (**Yr)** indicates the year that the entry took place (1983 –1989). Column 3 (**sic4)** shows the 4-digit SIC code the target entry belongs to (2011-3999). Column Four (**EnvRel)** shows the firm's ***Environmental relatedness*** score (note that this could just as easily be the firm's ***Product-market***

relatedness score as well). For instance, for Firm 1 in Row 1, its 1983 selection of 2011 (target business) combined with the firm's existing businesses result in an environmental relatedness score of 4.5. Column Five (**AvgEnvRel**) displays the firm's ***Average environmental relatedness between entries*** score. Column's Six through Column 13 show how all of the firm's other target entries' environmental relatedness scores are used to compute the **AvgEnvRel** score (Column Five). For example, the ***Average environmental relatedness between entries*** score for Firm 1's entry into business 2014 in 1985 (fourth observation, Row 4, in bold), was calculated by summing (5, 4.5, 5, and 7), and dividing by 4, for a score of 5.37500.

Table 1: Average Environmental Relatedness

Firm	Yr	sic4	Env Rel	Avg EnvRel	ENTER _1	ENTER _2	ENTER _3	ENTER _4	ENTER _5	ENTER _6	ENTER _7	ENTER _8
1	1983	2011	4.50	4.50000	.	.	.	.	.	.	.	.
1	1983	2012	5.00	5.00000	.	.	.	.	.	.	.	.
1	1983	2013	7.00	7.00000	.	.	.	.	.	.	.	.
1	1985	2014	5.00	**5.37500**	4.5	5	7.0	.	.	.	.	.
1	1985	2015	6.50	5.75000	4.5	5	7.0	.	.	.	.	.
1	1985	2016	7.50	6.00000	4.5	5	7.0	.	.	.	.	.
1	1987	2017	7.25	6.10714	4.5	5	7.0	5.0	6.5	7.5	.	.
1	1987	2019	6.00	5.92857	4.5	5	7.0	5.0	6.5	7.5	.	.
1	1989	2018	4.75	5.94444	4.5	5	7.0	5.0	6.5	7.5	7.25	6
2	1983	3011	5.50	5.50000	.	.	.	.	.	.	.	.
2	1983	3012	6.00	6.00000	.	.	.	.	.	.	.	.
2	1983	3013	7.50	7.50000	.	.	.	.	.	.	.	.
2	1985	3014	5.50	6.12500	5.5	6	7.5	.	.	.	.	.
2	1985	3015	4.50	5.87500	5.5	6	7.5	.	.	.	.	.
2	1985	3016	5.50	6.12500	5.5	6	7.5	.	.	.	.	.
2	1987	3017	6.25	5.82143	5.5	6	7.5	5.5	4.5	5.5	.	.
2	1987	3019	8.00	6.07143	5.5	6	7.5	5.5	4.5	5.5	.	.
2	1989	3018	2.75	5.72222	5.5	6	7.5	5.5	4.5	5.5	6.25	8

4.2.3 Control variables

(a) Firm-level controls

Firm size. Log of total assets, measured at time $t - 1$ of entry or exit. Firm size is controlled for to account for any size effects on entry or exit activities.

Leverage ratio. Book value of long-term debt to market value of equity, measured at time $t - 1$ of entry or exit. Leverage ratio is included to control for the financial resources of the firm that may affect entry and exit decisions.

Liquidity ratio. Current assets divided by current liabilities, measured at time $t - 1$ of entry or exit. Liquidity ratio is included as another control for the financial resources of the firm that may affect entry and exit decisions.

Return on assets. Net income divided by total assets.

Diversification. Berry-Herfindahl index of the firm's diversification defined as one minus $\sum i$=1,…Pi2, where P*i* is the proportion of sales in the *i*th business defined at the 4-digit SIC level, measured at time *t* of entry or exit. This is to control for the extent of the firm's diversification.

(b) Industry-level controls

The following are several industrial market structure variables frequently used in prior studies on diversification. Industrial market structure is controlled for because it determines the relative attractiveness of entry or exit.

Advertising intensity. Advertising expenses divided by sales (Montgomery & Hariharan, 1991; Sharma & Kesner, 1996;).

Capital intensity. Capital expenditures divided by sales (Montgomery & Hariharan, 1991; Sharma & Kesner, 1996).

.

Market concentration. Eight firm concentration ratio from the U.S. Bureau of the Census's *Census of Manufacturers* (Montgomery & Hariharan, 1991; Sharma & Kesner, 1996; Chang, 1996; Chang & Singh, 1999).

4.3 Study design

4.3.1 Principal components analysis with respect to the environmental variables

The environmental relatedness measure of my study compares the host firm's existing environment with the target's environment in terms of Dess & Beard's dimensions for munificence, complexity and dynamism. I was able to obtain information on *20* out of the original 23 measures Dess & Beard had used in their 1984 study. Furthermore, I was able to collect this information for *all* of the 4-digit SIC's in manufacturing (this includes 483 4-digit manufacturing industries

between SIC 2011 and 3999; Dess & Beard had used a sample of 52 4-digit manufacturing industries), and for my *entire* time period, which covers the years 1981-1989. Appendix B provides an abbreviated list of the 483 manufacturing 4-digit SIC's, as well as a description.

Given the magnitude of the environmental data collection effort, combined with the desire of wanting to use the data to its full potential, I decided to replicate the principal component analysis on the environmental variables which had been originally conducted by Dess and Beard in 1984. I hoped that I would be able to reconfirm Dess & Beard's original results. Furthermore, now that I had a larger and more current sample, in terms of the industries represented (483 vs. 52) and the years covered (1981-1989 vs. 1968-1977), I had the means to potentially extend them. Appendix C provides a complete listing of the environmental variables, including definitions, descriptions and data sources.

4.3.2 Model Specification

The hypotheses developed in Chapter 3 identify two dependent variables, entry and exit. Hypotheses 1-4 predict how product-market and environmental relatedness affects where a firm will enter. Hypotheses 5-8 predict how product-market and environmental relatedness affects where a firm will exit. The main empirical method applied in this study is longitudinal regression analysis. In each

equation the appropriate dependent variable is regressed against a vector of explanatory variables which include both hypothesized effects and control variables. A longitudinal research design is used, which pools the sample of firms (*i*) over time (*t*). Note that all independent variables are lagged by one year. The equation explaining entry can be written as follows:

Entry = *fn*(Product-market relatedness; environmental relatedness; product-market relatedness*environmental relatedness; controls)

The equation explaining exit can be written as follows:

Exit = *fn*(Product-market relatedness; environmental relatedness; product-market relatedness*environmental relatedness; average product-market relatedness between entries; average environmental relatedness between entries; controls)

4.3.2 Model Estimation

Empirical validation of the hypotheses is done through a longitudinal study. I examine the sample of 106 firms over the period of 1981 to 1989. The use of longitudinal data for testing the hypotheses is needed for two reasons. First, the

direction of causality needs to be demonstrated. Second, the lag between a firm's prior experience being absorbed by the firm as learning and then translated back into its future scope decisions is likely to be a year or longer. In this study, I lag all independent variables by one year.

This study is interested in dependent variables that are categorical; do firms enter and exit, or do they not. I will use a logit regression model because it is a widely used analytical method in the analysis of dichotomous choices. Linear regression methods work poorly for dichotomous Y variables because the errors are not Gaussian (or do not have constant variance) and the linear predictions can exceed the 0-1 boundaries. In our study, the true relationship between the probabilities and the predictor variables must be nonlinear. Logit regression avoids these problems by modeling the predicted probabilities as an S-shaped function (the cumulative logistic regression distribution) of the predictor values. I used the random state-based sampling technique to construct a sample of firms that enter and exit. This is used for efficiency reasons due to the fact that the population is dominated by one state (lack of entry and exit); logit estimation using data from state-based sampling will yield unbiased and consistent betas for all variables except the constant term (Manski & McFadden, 1981).

5 Results

This chapter contains the results from the hypothesis testing. In the first section I discuss the results of the principal components analysis with respect to the environmental variables. In the second section, I present the main results of the dissertation - the findings of the effects of product-market relatedness and environmental relatedness on the scope decision of entry, and the findings of how product-market relatedness and environmental relatedness affects the scope decision of exit. The results of the control variables are summarized in the third section. The key results of the dissertation are summarized in the last section.

5.1 Results of the Principal Components Analysis with Respect to the Environmental Variables

The environmental relatedness measure of my study compares the host firm's existing environment with the target's environment in terms of Dess & Beard's dimensions for munificence, complexity and dynamism. I was able to obtain information on *20* out of the original 23 measures Dess & Beard had used in their 1984 study. I conducted a principal components analysis followed by varimax

rotation for the 20 environmental variables.[2] Appendix D shows these results (the factors in Appendix D are ranked from left to right according to the proportion of the variance they explain). I applied the same factor analysis decision rules as Dess & Beard had earlier, including that: (1) at least three variables must load together at a level greater than or equal to .30 on each a priori factor, (2) the eigenvalue of any common factor was required to be greater than or equal to one, and (3) factors were required to exhibit a simple structure (Dess & Beard, 1984, p.61). Following these decision rules, particularly with respect to the second decision rule, five initial factors were identified. However, only three were interpretable and fit the simple structure criteria. In all, 55 percent of the total variance is explained with the three factor solution.

Factor 1 consists of five variables, containing all of the geographic concentration measures, including V15, V16, V17 and V18, as well as V6, Sales concentration. Four of these factor loadings met or exceeded .78, and the fifth factor loading was well above the threshold level of .30 with a score of .56. This

[2] A principal components analysis was employed to determine if the 20 variables used to measure the three environmental dimensions would group together in the same fashion as originally found by Dess and Beard in 1984. In the few cases where there was missing data, the Expectation-Maximization (EM) algorithm was used to compute the maximum likelihood estimates (MLE) parameters of a multivariate normal distribution (Dempster, Laird, & Rubin, 1977; McLachlan & Krishnan, 1997). The Expectation-Maximization (EM) algorithm is a technique for obtaining maximum likelihood estimates in parametric models for incomplete data. The MLE's were identified for the means and covariance matrix of the 20 variables, assuming a multivariate normal distribution. SAS PROC MI was then employed; it uses the means and standard deviations from available cases as the initial estimates for the EM algorithm. The resulting covariance matrix was then used in the principal components analysis.

factor clearly appears to represent the Complexity dimension of the environment and is similarly named in Appendix D. This factor explains 19 percent of the total variance.

Factor 2 consists of five variables, V1, V2, V3, V4 and V5, which represent all but one of the munificence variables. The loadings of these variables are also quite high, where four out of the five factor loadings met or exceeded .88, and the loading of the fifth variable was .48. This factor strongly represents the munificence dimension of the environment and is similarly named in Appendix D. This factor also explains 19 percent of the total variance.

Factor 3 consists of four variables, V11, V12, V13 and V14, which all come from the dimension of dynamism. The loadings of these variables are very high at .93, .92, .89, and .80. This factor noticeably represents the dynamism dimension of the environment and is similarly named in Appendix D. This factor explains 17 percent of the total variance.

Dess and Beard's final three dimensions comprised 14 of their original 23 environmental variables. Similarly, the principal components analysis I conducted reduced the environmental variables from 20 down to 14. The three factors that emerged confirm the conclusions obtained by Dess & Beard in that the environment can be correctly characterized by the three dimensions: munificence, complexity and dynamism. This replication of the principal components analysis on the environmental variables not only reconfirms Dess & Beard's original results,

but it *extends* them across additional industries (418 vs. 52) and time frames (1981-1989 vs. 1968-1977). I construct my measure of environmental relatedness in the next analyses based on these results.

5.2 Results on Entry and Exit

In this section I first give a brief overview of the firms' entry and exit activity during 1981-1989. Next I will discuss the descriptive statistics and correlations of the independent variables. In subsection 5.2.3 I discuss the results of the empirical test on entry. In subsection 5.2.4 I review the results of the empirical test on exit.

5.2.1 Brief Overview of Entry and Exit

This dissertation is interested in both the entry and exit decisions of firms. Appendix E provides a brief overview of the firms' entry and exit activity during 1983-1989. Our sample of 106 firms entered a total of 1730 manufacturing industries from 1983-1989. On average, each firm enters approximately 4.93 new 4-digit SIC manufacturing businesses per year. Throughout the time period of this study, each firm enters about 19.72 new businesses. In terms of the percentage of sales of those new entries contributing to the average total sales figures during

1981-1989, the new entries represent 24 percent of total sales. Our firms also exited 1377 manufacturing industries from 1983-1989. On average, each firm exits approximately 4.18 4-digit SIC manufacturing businesses per year, since 1981. Throughout the time period of this study, each firm exits about 16.72 businesses. Exit from these businesses accounts for 29 percent of total sales. This overview shows that our sample of firms were quite active in entry and exit during 1981-1989. Appendix F provides a complete listing of all of the variables, including definitions, descriptions and data sources.

5.2.2 Descriptive Statistics

Appendix G includes the descriptive statistics and correlations for all the variables. It is important to point out that even though most of the correlations are low, many are significant because of the large sample size. Any correlation below .32 is explaining less than 10 percent of the variance. The low correlation (.24) between ***Product-market relatedness*** $_{kt-1}$ and ***Environmental relatedness*** $_{kt-1}$ is noteworthy: it indicates that these two variables represent two distinct types of relatedness.

5.2.3 Results on Entry – Hypotheses 1,2,3 and 4

The GEE logit regression results of the effects of product-market relatedness and environmental relatedness on entry in the manufacturing sector during 1981-1989 are displayed in Appendix H. Two out of four hypotheses are supported (H1 and H4). I use the statistical package SAS 9.0 to estimate all models.

A total of 1730 cases of 4-digit SIC entry events are used in the GEE logit regression. In contrast to the 1730 entry events, there were 195,747 valid instances of non-entry events. There are 483 4-digit manufacturing industries in the standard industry classification, which can be potential targets entry. The following calculation (Table 2) demonstrates where the 195,747 instances of non-entry events come from:

Table 2: Total Number of Possible Firm-Industry Combinations

(106 firms x 483 4-digit SIC industries x 4 years - 83, 85, 87 and 89) =	204,792
- actual entry events	1,730
- firms' participation of industries as of 1981	7,315
Total non-entry events	195,747

I employed the state-based random sampling technique to construct our sample of entries and non-entries (Manski & McFadden, 1981). This way, the non-entry cases will not dominate the entry cases. All independent and control variables are lagged by one year. The logit model estimates the coefficients for the entry option while setting the coefficients of the non-entry option as zero. Therefore, we must interpret the estimated coefficients as the marginal effects of the covariates leading to the choice of entry option over the non-entry option. [3]

In Appendix H the first column reports the base model where ***Firm size*** $_{kt-1}$, ***Leverage ratio*** $_{kt-1}$, ***Liquidity ratio*** $_{kt-1}$, ***Return on assets*** $_{kt-1}$, ***Diversification*** $_{kt-1}$, ***Advertising intensity*** $_{kt-1}$, ***Capital intensity*** $_{kt-1}$, and ***Market concentration*** $_{kt-1}$ are included as control variables. Model Two introduces ***Product-market relatedness*** $_{kt-1}$ to investigate its effect on entry. Model Three introduces the ***Environmental***

[3] The data analysis involved examining the impact of industry controls, firm controls, product market relatedness (PMR), and environmental relatedness (ENVR). The analysis used a generalized linear model with the outcome modeled as a binomial distribution (McCullagh & Nelder, 1989). The binomial distribution involved two discrete events; entry or non-entry into a particular industry. The logit link function was used in the analysis (Allison, 1995). In addition, the generalized linear model incorporated the Generalized Estimating Equation (GEE) model (Liang & Zeger, 1986), to account for the variation in entry choice due to the potential firm similarity. In the GEE approach, any required covariance structure and link function can be assumed and parameters estimated without specifying the joint distribution. Since the parameters specifying the structure of the correlation matrix are rarely of great practical interest, an exchangeable structure will be used to model the within-firm similarity. The exchangeable structure implies that each potential entry is equally correlated. Liang and Zeger (1986) showed that even when the working correlation matrix was incorrectly specified, the parameter estimates are still valid. This approach is also identified as a marginal generalized linear model and appears useful in analyzing non-independent categorical data (Lipsitz, Fitzmaurice, Orav, & Laird, 1994; Lipsitz, Kim, & Zhao, 1994). The models were fit using the SAS GENMOD procedure.

relatedness $_{kt-1}$ variable. Model Four contains the interaction effects of ***Product-market relatedness*** $_{kt-1}$ and ***Environmental relatedness*** $_{kt-1}$. I discuss the results based on the full model (Model Four) in Appendix H. The log likelihood estimates indicating the fit of each model are given at the bottom of the table.

In Hypothesis 1 I proposed that product-market relatedness has a positive effect on the likelihood of entry. Model Four in Appendix H provides a test for this hypothesis and supports the proposition. After controlling for a variety of firm and industry characteristics, the estimated coefficient for the ***Product-market relatedness*** $_{kt-1}$ variable is positive and significant in Model Four, supporting the hypothesis that the closer the host and target industries are in terms of product-market relatedness, the greater the likelihood that the firm will enter that industry.

Hypothesis 2 proposed a positive relationship between environmental relatedness and entry, and this hypothesis is not supported in Model Four. The estimated coefficient for the ***Environmental relatedness*** $_{kt-1}$ variable is negative and significant in Model Four, thus suggesting a negative relationship between environmental relatedness and entry. I examine the possible explanations for this negative effect in Section 5.5.

In Hypothesis 3 I proposed that product-market relatedness and environmental relatedness leverage each other, resulting in a combined positive effect on entry. The estimated coefficient for ***Product-market relatedness*** $_{kt-1}$ * ***Environmental relatedness*** $_{kt-1}$ is negative and significant. Thus, the hypothesis

that product-market relatedness and environmental relatedness, together, will have the strongest influence on the direction of a firm's entry choices is not supported. I examine the possible explanations for this negative effect in Section 5.5.

Hypothesis 4 proposed that firms will be more likely to focus on product-market issues than environmental issues – therefore, product-market relatedness will have a stronger influence on the direction of a firm's entry choices than environmental relatedness. The standardized beta coefficients for these variables in Model Four in Appendix H provide a test for this hypothesis. The coefficient on ***Product-market relatedness*** $_{kt-1}$ is .87, whereas the coefficient on ***Environmental relatedness*** $_{kt-1}$ is only -.11. The larger beta coefficient on product-market relatedness supports the idea that firms will be more influenced by product-market relatedness than environmental relatedness in their entry decisions.

5.2.4 Results on Exit – Hypotheses 5, 6, 7 and 8a-b

The GEE logit regression results on the effects of product-market relatedness and environmental relatedness on exit in the manufacturing sector during 1981-1989 are reported in Appendix I.[4] Three of the five hypotheses (H5,

[4] The only difference for the exit analysis was to use the complementary log-log (cloglog) link function instead of the logit link function. Although the logit and cloglog functions produce almost identical results when the risk for a transition is low in discrete time models (Singer & Willett, 2003), the cloglog function has the advantage of providing the closest similarity to a continuous time model which has been used in prior research (see

H6, H8a) are supported, leaving two hypotheses (H7 and H8b) not supported. I again use the statistical package SAS 9.0 to estimate all models.

My sample of 106 firms participated in a total of 2385 4-digit manufacturing industries as of 1981. Only firms' first exit from a 4-digit manufacturing industry was used in the GEE logit analysis. A total of 1377 cases of 4-digit SIC exit events were used in the analysis. This represents 57 percent of the original 2385 4-digit manufacturing industries. In contrast to the 1377 exit events, there were 7522 valid instances of non-exit events. The following calculation (Table 3) shows where the 7522 instances of non-exit events come from:

Table 3: Breakdown of Valid Instances of Non-Exit Events.

106 firms participation in 4-digit SIC industries as of 1981[5]: 2385

	Exit events	4-digit SIC's remaining as possible exit choices	Non-Exit events
1983			
221 actual cases of exit, with 2385 possible exit choices to exit out of	221	2385	2385
1985			
436 actual cases of exit, with 2164 possible exit choices	436	2385 – 221 = 2164	2164
1987			
483 actual cases of exit, with 1728 possible exit choices	483	2164 – 436 = 1728	1728
1989			
237 actual cases of exit, with 1245 possible exit choices	237	1728 – 237 = 1245	1245

Chang, 1996). The estimated parameters using the cloglog link function have the same interpretation as relative risks as the Cox regression model and the model is invariant to interval length (Allison, 1995).

[5] Firms can only exit a 4-digit SIC code once.

Totals:	**1377**	**7522**

Again, to compensate for the disproportionate number of actual exit events to non-exit events, I employed the state-based random sampling technique to construct our sample of exits to non-exits (Manski & McFadden, 1981). All independent and control variables are lagged by one year. The logit model estimates the coefficients for the exit option while setting the coefficients for the non-exit option as zero. Therefore, we must interpret the estimated coefficients as the marginal effects of the covariates leading to the choice of exit option over the non-exit model.

In Appendix I the first column reports the base model where ***Firm size*** $_{kt-1}$, ***Leverage ratio*** $_{kt-1}$, ***Liquidity ratio*** $_{kt-1}$, ***Return on assets*** $_{kt-1}$, ***Diversification*** $_{kt-1}$, ***Advertising intensity*** $_{kt-1}$, ***Capital intensity*** $_{kt-1}$, and ***Market concentration*** $_{kt-1}$ are included as control variables. Model Two introduces ***Product-market relatedness*** $_{kt-1}$ to investigate its effect on exit. Model Three introduces the ***Environmental relatedness*** $_{kt-1}$ variable. Model Four contains the interaction effects of ***Product-market relatedness*** $_{kt-1}$ and ***Environmental relatedness*** $_{kt-1}$. In Model Five both ***AvgProductMktRel*** $_{kt-1}$ and ***AvgEnvironmentalRel*** $_{kt-1}$ are entered simultaneously. I discuss the results based on the full model (Model Five) in Appendix I. The log

likelihood estimates indicating the fit of each model are given at the bottom of the table.

In Hypothesis 5 I proposed that that product-market relatedness has a negative relationship with exit. Model Five in Appendix I provides a test of this hypothesis and supports the proposition. The estimated coefficient for the ***Product-market relatedness*** $_{kt-1}$ variable is negative and significant, supporting the hypothesis that the farther the host and target industries are in terms of product-market relatedness, the greater the likelihood that the firm will exit that industry.

Hypothesis 6 proposed a negative relationship between environmental relatedness and exit, and this hypothesis is also supported in Model Five. The coefficient for ***Environmental relatedness*** $_{kt-1}$ is negative and significant, thus supporting the hypothesis that the farther the host and target industries are in terms of environmental relatedness, the greater the likelihood that the firm will exit that industry.

The tests for Hypothesis 7 are included in Model Five. This hypothesis predicted that firms were more likely to focus on product-market issues than environmental issues, resulting in firms exiting businesses in the following order – (1) product-market unrelated, environmental unrelated, (2) product-market unrelated, environmental related, (3) product-market related, environmental unrelated, (4) product-market related, environment related. The following 2 x 2 table (Table 4) is included to help clarify the order of exit:

Table 4: Order of Exit

		Product-market	
		Related	Unrelated
Environment	Related	4	2
	Unrelated	3	1

The standardized beta coefficients on these variables in Model Five in Appendix I provide a test for the first part of this hypothesis. The coefficient on ***Product-market relatedness*** $_{kt-1}$ is -.43 whereas the coefficient on ***Environmental relatedness*** $_{kt-1}$ is only -.11. The larger beta coefficient on product-market relatedness supports the idea that firms will be more influenced by product-market relatedness than environmental relatedness in their exit decisions. Therefore, firms will exit businesses in Box 1 and 2 (Product-market unrelated) before they would consider exiting businesses in Boxes 3 and 4 (Product-market related). I also more specifically proposed in Hypothesis 7 that product-market relatedness and

environmental relatedness leverage each other, resulting in a combined negative effect on exit. However, the estimated positive and significant interaction between ***Product-market relatedness*** $_{kt-1}$ * ***Environmental relatedness*** $_{kt-1}$ does not provides support for this hypothesis, and the expected order of businesses is not confirmed.

In Hypothesis 8a I predicted that average product-market relatedness has a negative relationship with exit, and is supported in Model Five. The coefficient for ***AvgProductMktRel*** $_{kt-1}$ is negative and significant, supporting the hypothesis that the smaller the average distance in product-market relatedness between successive entries into businesses, the lower the likelihood of exit.

Hypothesis 8b proposed a negative relationship between average environmental relatedness and exit. The estimated positive interaction between average environmental relatedness and exit does not support this hypothesis. Thus, Hypothesis 8b - the smaller the average distance in environmental relatedness between successive entries into businesses, the lower the likelihood of exit – fails to be supported.

5.3 Control Variables

A total of eight control variables were included in the logit regression analyses on entry and exit. At the firm level, I included control variables for the firm's size, financial resources and prior experiences in entry and exit. At the industry level, I included three industrial market structure variables indicating the relative attractiveness of entry or exit. Overall, only two control variables were significant in the entry analysis (***Firm size*** $_{kt-1}$, and ***Market concentration*** $_{kt-1}$) and only one variable was significant in the exit analysis (***Firm size*** $_{kt-1}$).

In the entry analysis, the coefficients on the firm's size, financial resources and prior experiences are all positive, suggesting a positive relationship with the likelihood of entry. However, only the coefficient on the variable ***Firm size*** $_{kt-1}$ is significant. This indicates that a firm's slack, as well as other resources, increases its likelihood of entry. At the industry level, the coefficients on ***Advertising intensity*** $_{kt-1}$, ***Capital intensity*** $_{kt-1}$, and ***Market concentration*** $_{kt-1}$ are all negative, yet only the coefficient on the variable ***Market concentration*** $_{kt-1}$ is significant. Market concentration can signify high entry barriers and tough, incumbent competitors thereby decreasing the likelihood of entry. On the whole, firm size has a positive effect on the likelihood of entry while market concentration has a negative effect on entry.

In the exit analysis, the coefficients on the firm's size, financial resources and prior experiences were all negative, with one exception of ***Return on assets*** $_{kt-1}$ that had a positive sign, suggesting an overall negative relationship with the likelihood of exit. Moreover, out of the five firm level control variables, only firm size was significant, indicating that slack and other resources seems to decrease the likelihood of exit. Two of the industry control variables, ***Advertising intensity*** $_{kt-1}$ and ***Capital intensity*** $_{kt-1}$ have positive coefficients, indicating a positive relationship with the likelihood of exit. However, the coefficients are not significant. The last industry level control variable, ***Market concentration*** $_{kt-1}$, has a negative coefficient but it is not significant. Overall, the only one variable was significant in the exit analysis, ***Firm size*** $_{kt-1}$, and it indicated a negative relationship with the likelihood of exit.

5.4 Summary of the Key Results

Appendix J has a summary of all of the hypotheses and the corresponding results. Overall, the results provide evidence that product-market relatedness and environmental relatedness affect the entry and exit decisions of firms. Two hypotheses (H1 and H4) out of a total of four hypotheses presented on entry were supported and significant. Likewise, three hypotheses (H5, H6 and H8a) out of a

total of five hypotheses presented on exit were supported and significant. The key results are summarized below.

I found that product-market relatedness has a positive effect on the likelihood of entry (Hypothesis 1). The unexpected result of the study, that environmental relatedness has a *negative* effect on entry, instead of a positive effect, deserves more attention (Hypothesis 2). To summarize, this result is saying that the farther the firm and its target are, in terms of environmental relatedness, the more likely it is that the firm will enter that industry. A possible explanation for this interesting result is that firms have not yet recognized how to distinguish between different environments. Thus, they are unable recognize if a potential target's environment is similar to their existing one.

The data did not provide evidence that product-market relatedness and environmental relatedness leverage each other in the likelihood of entry (Hypothesis 3). A possible explanation for this finding is that firms have not yet recognized and/or do not feel that a unique synergy results from the two types of relatedness. I do find confirmation that firms focus more on product-market relatedness than environmental relatedness (Hypothesis 4). The confirmation of Hypothesis 4 may also help to explain my non-finding in Hypothesis 2 *and* 3 – firms are so focused on product-market relatedness that they have yet to consider, discover or develop: (1) environmental relatedness, by itself, or (2) the synergy

between product-market relatedness and any other kind of relatedness, including environmental relatedness, with respect to entry.

Turning now to the scope decision of exit, the results of the study also provide support for the hypothesis that product-market relatedness has a negative effect on exit (Hypothesis 5). In addition, I found that environmental relatedness has a negative effect on the likelihood on exit (Hypothesis 6). In Hypothesis 7 I proposed that product-market relatedness will have a stronger influence on the direction of exit than environmental relatedness and that firms will exit businesses in an order that reflects this assertion. The data provide a mixed message on this proposition. The larger beta coefficient on product-market relatedness supports the idea that firms will be more influenced by product-market relatedness than environmental relatedness in their exit decisions. However, the order of exit is not confirmed with the interaction.

I also found that the smaller the average distance in product-market relatedness between successive entries into businesses, the lower the likelihood of exit (Hypothesis H8a). The data reported that accompanying hypothesis - that the smaller the average distance in environmental relatedness between successive entries into businesses, the lower the likelihood of exit – was not supported (Hypothesis 8b).

6 Conclusion

In this chapter I discuss the key contributions of this dissertation. The chapter is divided into three sections. First, I discuss the dissertation's contributions to theory and research. The second section describes the contributions to practice. Last, I present some directions for future research and conclude the dissertation.

6.1 Contributions to Theory and Research

Research has either pursued the exploration of firm's entry choices to the exclusion of its exit choices, or vice versa. Research examining the combination of the two concurrently (both entry and exit), has been almost completely ignored by the literature. A simple search on diversification and divestments immediately dwarfs the amount of research completed on corporate evolution. Corporate evolution, just as its name implies, requires an examination over time. It is only through knowing where the firm is currently at and understanding where it has been before that we can predict were the firm will be in the future.

My examination of learning and corporate evolution draws on a concept heavily used from the diversification literature – the concept of relatedness. Relatedness naturally lends itself to the learning literature, for if something is

related it is familiar to a prior experience and it is the compilation of experiences that serve as the building blocks to learning.

It is through product-market relatedness and environmental relatedness that I am trying to tap into the constructs of product-market learning and environmental learning. I suggest that product-market learning is the accumulation of the concrete "know what" and hard facts derived from a firm's experiences in a given set of product-markets. This idea of acquiring the *substantive* knowledge of a business can be extended beyond product-markets (where I focus), and can include the "content" learning gained from a firm's experiences in terms of technologies, distribution channels, scientific research and production processes. Environmental learning is defined as the firm's accumulation of the elusive "know how" knowledge gained from its experiences managing businesses in different decision-making environments. Environmental learning taps into the notion of the dominant logic, defined as a way of thinking or managing in a given business (Prahalad & Bettis, 1986).

My selection of examining product-market relatedness and environmental relatedness on corporate evolution was intended to draw in theoretical perspectives usually not paired together. Product-market relatedness and "content" learning draws heavily on the resource-based view perspective. In contrast, environmental relatedness or "context" learning draws primarily on evolutionary economics, path dependence and the strategic decision-making perspectives. This distinction

mirrors the strategy field more generally, where "content" issues are analyzed separately from "process" issues (I maintain that "context" issues are subsumed in the process strategy research stream). I argue that by applying the lens of two research streams *together*, and their accompanying theories, clearly enhances our understanding of an understudied phenomenon. I also believe that this triggers a constructive dialog on the value of opening up the notion of relatedness to include both "content" and "process" dimensions.

This dissertation directly responds to the call that "more effort has gone into identifying knowledge as the basis of competitive advantage than into explaining how organizations can develop, retain and transfer (their) knowledge" (Argote & Ingram, 2000, p.156). By examining a firm's experiences over time, it is possible to trace how the firm develops, retains and transfers its knowledge across its choices. I argue that it is this *internal insight* that creates value for the firm. In examining the corporate evolution of firms, we find new understanding into the processes behind one of the most fundamental questions in strategy: how value is created.

Another contribution derived from this dissertation pulls from the resource-based view. The knowledge building capability is a resource that firms seek to attain. I argue that a firm's distinctive knowledge building capabilities will indicate certain directions *for growth as well as decline*. Thus, if a firm's actions follow the suggestions of its knowledge building resource, our analysis of corporate evolution

using the resource-based view can help us to answer a fundamental question is strategy; how does a firm develop a unique resource that serves as a sustainable advantage (Porter, 1980; Barney, 1986).

In sum, this dissertation is the exploration and development of corporate evolution by integrating the resource-based view, organizational learning, evolutionary economics, path dependence and strategic decision-making perspectives. Rarely have these perspectives been applied simultaneously, and through their application we gain a unique and comprehensive understanding of the understudied phenomenon of corporate evolution.

6.2 Contributions to Practice

This dissertation contributes to managers obtaining a better understanding of how their firms can conduct their strategic choices more appropriately - in order to maximize their firm's learning experience and knowledge accumulation. Top management teams can evaluate their firm's learning capabilities more thoroughly and select their firm's next strategic choices accordingly. This strategy will allow the firm to leverage its prior knowledge and learning and thus, increase its performance in its strategic choices both now and in the future.

6.3 Directions for Future work and Conclusion

In this dissertation, I examine the relationship between organizational learning and corporate evolution. More specifically, I analyze the *type* of scope experience acquired by the firm and how this affects its future scope choices. A natural direction for future research that comes from this dissertation is to follow up with a different dependent variable and evaluate the impact of a firm's scope experiences (*type*) on the firm's performance.

Additionally, another direction for future research is to build on my analysis of the *type* of scope experience acquired by the firm with two more dimensions of a firm's scope experiences; sequencing and pacing, and see if these dimensions have different effects of the firm's future scope selections and performance. For example, I claim that a firm's scope sequencing, i.e. the order of the firm's scope experiences, provides the benefit of skill building, affects the performance of the firm's future scope experiences. A firm's scope pacing, i.e. the time in between the firm's scope actions, is hypothesized to provide the benefits of absorption, fermenting, and renewal, affecting the performance of the firm's future scope choices.

I believe that over time, pursuing these research directions, the comprehensive findings will provide evidence that (1) what a firm learns *(type)*, (2) what order the firm learns it (*sequencing*), and (3) the speed the firm learns it at

(*pacing*), does indeed affect the organization's future scope choices *and* the performance of those choices.

A third and purely theoretical direction for future research would be to develop an understanding of learning within the framework of "content" and "process" learning, derived from the notion of "content" and "process" research within the strategy field. This could bridge together theories not typically applied together and potentially uncover many rich insights. One avenue that comes to mind in helping to shape this future direction is the concepts of declarative and procedural memory from the psychology field.

In sum, I examine corporate evolution, i.e. how a firm changes its scope through diversification into new businesses and exits from existing ones and what it learns in the process. I find that product-market relatedness and environmental relatedness do impact a firm's scope decisions. I show that firms focus heavily on product-market relatedness, and potentially to the detriment of their fully understanding environmental relatedness. Thus, by firms not completely comprehending their environmental experiences, I provide one explanation for an unanswered riddle in the strategy literature: why does related diversification fail?

Appendix A:

Variables Of The Study And The Proposed Effects

	Proposed sign	Hypothesis
ENTRY (DV)		
Product-market relatedness	+	H1
Environmental relatedness	+	H2
Product-market relatedness * environmental relatedness	+	H3
Product-market relatedness will have a stronger influence on the direction of a firm's entry choices than environmental relatedness	Larger beta on product-market relatedness coefficient	H4
EXIT (DV)		
Product-market relatedness	_	H5
Environmental relatedness	_	H6
Product-market unrelatedness will have a stronger influence on the direction of exit than environmental unrelatedness Product-market relatedness *environmental relatedness	Larger beta on product-market relatedness coefficient _	H7
Average product-market distance between entries	_	H8a
Average environmental distance between entries	_	H8b

Appendix B:

4-Digit SIC Classification Codes for Manufacturing

483 4-Digit SIC's between 2011 – 3999

(this list only provides a sample of 3 pages as representation of the entire pool)

4-Digit SIC	Description
2011	Fresh And Frozen Meat From Animals Slaughtered In This Plant
2013	Sausage And Other Prepared Meats, Not Made In Meat Packing Plants
2015	Poultry And Egg Processing
2021	Creamery Butter
2022	Cheese, Natural And Processed
2023	Dry, Condensed, And Evaporated Milk Products
2024	Ice Cream And Frozen Desserts
2026	Fluid Milk
2032	Canned Specialties
2033	Canned Fruits And Vegetables
2034	Dried And Dehydrated Fruits, Vegetables, And Soups
2035	Pickles, Sauces, And Salad Dressings
2037	Frozen Fruits And Vegetables
2038	Frozen Specialties, N.E.C.
2041	Flour And Other Grain Mill Products
2043	Cereal Breakfast Foods
2044	Rice Milling
2045	Prepared Flour Mixes And Doughs
2046	Wet Corn Milling
2047	Dog And Cat Food
2048	Prepared Feeds, N.E.C.
2051	Bread, Cake, And Related Products
2052	Cookies And Crackers
2053	Frozen Bakery Products
2061	Raw Cane Sugar
2062	Cane Sugar Refining
2063	Beet Sugar
2064	Candy And Other Confectionery Products
2066	Chocolate And Cocoa Products
2067	Chewing Gum
2068	Nuts And Seeds
2074	Cottonseed Oil Mills
2075	Soybean Oil Mills

2076	Vegetable Oil Mills, N.E.C.
2077	Animal And Marine Fats And Oils
2079	Edible Fats And Oils, N.E.C.
2082	Malt Beverages
2083	Malt
2084	Wines, Brandy, And Brandy Spirits
2085	Distilled And Blended Liquors
2086	Bottled And Canned Soft Drinks
2087	Flavoring Extracts And Syrups, N.E.C.
2091	Canned And Cured Fish And Other Seafoods
2092	Fresh Or Frozen Prepared Fish And Other Seafood
2095	Roasted Coffee
2096	Potato Chips And Similar Products
2098	Macaroni And Spaghetti
2099	Food Preparations, N.E.C.
2111	Cigarettes, Including Nontobacco Cigarettes
2121	Cigars
2131	Chewing And Smoking Tobacco
2141	Tobacco Stemming And Redrying
2211	Broadwoven Fabric Mills, Cotton
2221	Broadwoven Fabric Mills, Manmade Fiber And Silk
2241	Narrow Fabric Mills
2251	Women'S Hosiery, Except Socks
2252	Hosiery, N.E.C.
2253	Knit Outerwear Mills
2254	Knit Underwear Mills
2257	Weft Knit Fabric Mills
2261	Finishing Plants, Cotton
2262	Finishing Plants, Manmade Fiber And Silk
2269	Finishing Plants, N.E.C.
2273	Carpets And Rugs
2281	Yarn Spinning Mills
2282	Yarn Throwing And Winding Mills
2284	Thread Mills
2295	Coated Fabrics, Not Rubberized
2296	Tire Cord And Tire Cord Fabrics
2297	Nonwoven Fabrics
2298	Cordage And Twine
2299	Textile Goods, N.E.C.
2311	Men'S And Boys' Suits And Coats
2321	Men'S And Boys' Shirts
2322	Men'S And Boys' Underwear And Nightwear
2325	Men'S And Boys' Trousers And Slacks
2326	Men'S And Boys' Work Clothing
2329	Men'S And Boys' Clothing, N.E.C.

2331	Women'S, Misses', And Juniors' Shirts And Blouses
2335	Women'S, Misses', And Juniors' Dresses
2337	Women'S, Misses', And Juniors' Suits, Skirts, And Coats
2339	Women'S, Misses', And Juniors' Outerwear, N.E.C.
2342	Brassieres, Girdles, And Allied Garments
2353	Hats, Caps, And Millinery
2361	Girls', Children'S, And Infants' Dresses, Blouses, And Shirts
2369	Girls', Children'S, And Infants' Other Outerwear, N.E.C.
2381	Dress And Work Gloves And Mittens
2385	Waterproof Outerwear
2386	Leather And Sheep-lined Clothing
2389	Apparel And Accessories, N.E.C.
2391	Curtains And Draperies
2392	Housefurnishings, N.E.C.
2393	Textile Bags
2394	Canvas And Related Products
2395	Pleating And Stitching
2396	Automotive Trimmings, Apparel Findings, And Related Products
2399	Fabricated Textile Products, N.E.C.
2411	Logging
2421	Sawmills And Planing Mills, General
2426	Hardwood Dimension And Flooring Mills
2429	Special Product Sawmills, N.E.C.
2431	Millwork
2434	Wood Kitchen Cabinets
2435	Hardwood Veneer And Plywood
2436	Softwood Veneer And Plywood
2439	Structural Wood Members, N.E.C.
2441	Nailed Wood Boxes And Shook
2449	Wood Containers, N.E.C.
2451	Mobile Homes
2452	Prefabricated Wood Buildings
2491	Wood Preserving
2493	Reconstituted Wood Products
2499	Wood Products, N.E.C.
2511	Wood Household Furniture
2512	Upholstered Household Furniture
2514	Metal Household Furniture
2515	Mattresses, Foundations, And Convertible Beds
2517	Wood Television And Radio Cabinets
2519	Household Furniture, N.E.C.
2521	Wood Office Furniture
2522	Office Furniture, Except Wood
2531	Public Building And Related Furniture
2541	Wood Partitions And Fixtures

Appendix C:

List of Environmental Variables, Definitions, Descriptions and Data Sources

Variables of interest	Definition	Description	Data Source
V1. Growth in total sales	Value of shipments; regression slope coefficient (*B*), divided by mean value (*Y*); 1981 –1989.	Calculate regression slope of total sales growth on time using all prior years (e.g., 77-80 for year 81) with time (years) coded as sequential integers starting with zero. Calculate mean for growth in total sales using all prior years (e.g., 77-80 for year 81).	U.S. Bureau of the Census, *Census of Manufactures*
V2. Growth in price-cost margin	Value added by manufacture minus total wages; same measurement procedure as V1.	Same as V1 except wages are subtracted from value before.	Same as V1.
V3. Growth in total employment	Total employment; same measurement procedure as V1.	Same as V1 except for different outcome.	Same as V1.
V4. Growth in value added by manufacture	Value added by manufacture; same measurement procedure as V1.	Same as V1 except for different outcome.	Same as V1.
V5. Growth in the number of manufacturing establishments	Number of manufacturing establishments, average annual percentage change.	Calculate the percentage growth by calculating the difference between the current year and the previous year and divide the difference by the previous year value.	Same as V1.
V6. Sales Concentration	Percentage of total value of shipments by the largest 8 companies.	This variable was converted into integer format by dividing by 100 to created a percentage bounded by zero and 1; Blau method.	Same as V1.

Variables of interest	Definition	Description	Data Source
V7. Concentration of inputs	Measure of the heterogeneity of a given industry's input environment - reflects the extent to which a large portion of an industry's input was supplied by relatively few industries (an index that increases with the number of different input industries and the evenness of the distribution of inputs among these industries).	Calculated total intermediate inputs for each IO industry code (excludes value added entries). For each IO industry code, divide row UseTableCell by the total for the IO industry code and square. Then, sum the squared percentages. Finally, map the IO codes back to the SIC 4-digit codes. Herfindahl index.	U.S. Bureau of Economic Analysis, Input-Output Structure of the U.S. Economy
V8. Diversity of products	Measures the degree to which the output of a four-digit industry was concentrated within a few, seven-digit SIC products or was spread evenly among many.	For each 7-digit SIC value, create SIC 4-digit variable from 1st 4 digits and 3-digit from last 3 digits. Calculated total sales across 4-digit and sub-totals for each 3-digit code within each sic 4-digit code. For each 3-digit code, divide the 3-digit sub-total by the total for the 4-digit SIC code and square. Then, sum the squared percentages across all 3-digit codes within each 4-digit code. Blau method.	Same as V1.
V9. Specialization ratio	Ratio of primary product shipments to total (primary and secondary, excluding miscellaneous) product shipments for the establishments classified in the industry.	This variable was converted into integer format by dividing by 100 to created a percentage bounded by zero and 1.	Same as V1.

Variables of interest	Definition	Description	Data Source
V10. Concentration of outputs	Measure of the heterogeneity of a given industry's output task environment – reflects the extend to which a large portion of a industry's output was purchased by relatively few industries.	Same as V7 except the total value added is summed with the total intermediate products to create the denominator. Herfindahl index.	Same as V7.
V11. Instability in total sales	Value of shipments; standard error of the regression coefficient (*S*) divided by mean value (*Y*); 1981-1989.	Calculate standard error of regression slope of total sales growth on time using all prior years (e.g., 77-80 for year 81) with time (years) coded as sequential integers starting with zero. Calculate mean for growth in total sales using all prior years (e.g., 77-80 for year 81).	Same as V1.
V12. Instability in price-cost margin	Value added by manufacture minus total wages; same measurement procedure as V11.	Same as V11 except for different outcome.	Same as V1.
V13. Instability in total employment	Total employment; same measurement procedure as V11.	Same as V11 except for different outcome.	Same as V1.
V14. Instability in value added by manufacture	Value added by manufacture; same measurement procedure as V11.	Same as V11 except for different outcome.	Same as V1.

Variables of interest	Definition	Description	Data Source
V15. Geographical concentration of total sales	Measure of the geographical concentration of total sales.	Created variable with 10 unique values representing different regions. Calculated total sales across regions and sub-totals for each region for each sic 4-digit code. For each region, divide the region sub-total by the total for the 4-digit SIC code and square. Then, sum the squared percentages across all regions with percentages to arrive at a total sum. Blau method.	Same as V1.
V16. Geographical concentration of value added by manufacture	Measure of the geographical concentration of value added by manufacture.	Same as V15 except for different outcome.	Same as V1.
V17. Geographical concentration of total employment	Measure of the geographical concentration of total employment.	Same as V15 except for different outcome.	Same as V1.
V18. Geographical concentration of industry establishments	Measure of the geographical concentration of industry establishments.	Same as V15 except for different outcome.	Same as V1.
V19. Impact of all other industries on output of given industry	The sum of all requirements, both direct and indirect, placed on a given industry if every industry increased its output by one unit.	Multiply the total requirements coefficient for each industry with c_UseTableCell and sum across all rows within an IO Industry code. Map IO code back to SIC 4-digit codes.	Same as V7.

Variables of interest	Definition	Description	Data Source
V20. Relative power of indirectly linked factors on output	The sum of just the indirect requirements placed on an industry if every industry increased its output by one unit.	Multiply the **Total** requirements coefficient for each industry with c_UseTableCell row values and then substract from it the product of the c_UseTableCell row values multiplied by the **Direct** requirements coefficient. Divide this difference by the product of the c_UseTableCell row values multiplied by the **Direct** requirements coefficient. Sum across all rows within an Industry code. Map IO code back to SIC 4-digit codes.	Same as V7.

Appendix D:

Principal Components Analysis On Twenty Environmental Variables With A Three Factor Solution

Variable	Complexity	Munificence	Dynamism	Factor4	Factor5
v15geoshipmts	.93				
v16geovaladd	.93				
v17geoemploye	.89				
v18geoestab	.78			.21	
v6_salesconcen	.56				
v8shipvalrev	-.41			-.40	.37
v4_ValueAddedGrowth		.94	-.22		
v1_TotalSalesGrowth		.94			
v2_PriceCostGrowth		.91	-.22		
v3_TotalEmployGrowth		.88			
v5_NumEstabGrowth		.48			
v14_ValueAddedInstab			.93		
v11_TotalSalesInstab			.92		
v12_PriceCostInstab	.22		.89		
v13_TotalEmployInstab			.80		
v10sum_OutputConPer	.20			.91	
v7sum_InputConPer				.91	
v20sum_RelativeImpact					.79
v9_SpecialRatio		-.23		.29	-.38
v19sum_AllOtherImpact				-.33	-.61
Total Variance Explained	3.85	3.75	3.38	2.12	1.34
Percent Variance	19%	19%	17%	11%	7%
STATUS	***Keep***	***Keep***	***Keep***	***Drop***	***Drop***

Appendix E:

Overview of Entry and Exit Activity of 106 Sample Firms

in Manufacturing During 1981-89

	1981-83	1983-85	1985-87	1987-89	Total	Per firm average per year	Per firm average throughout time period of study	Size[6]
ENTRY	209	343	664	514	1730	4.93	19.72	24%
EXIT	221	436	483	237	1377	4.18	16.72	29%

[6] Size indicates the average proportion of sales of entered or exited businesses to the total sales figure (from 1981-1989) of a company.

Appendix F:

List of Variables, Definitions, Descriptions and Data Sources

Variables of interest	Definition	Description	Data Source
Dependent variables			
1. Entry$_{kj}$	Entry is measured as a 0 or 1 variable, depending on whether or not firm *k* entered a given 4-digit SIC industry *j* after 1981.	The entry variable is coded 1 for all SIC 4-digit codes that a firm enters and 0 if the firm does not enter that 4-digit SIC code. If the firm is already in 4-digit SIC value, it is coded as a 9 and then selected out. Only manufacturing SIC 4-digit codes are used.	Trinet data
2. Exit$_{kj}$	Exit is measured as a 0 or 1 variable, depending on whether or not firm *k* exited a given 4-digit SIC industry after 1981.	The exit variable is coded 1 for all SIC 4-digit codes that a firm exits and 0 if the firm does not exit that 4-digit SIC code. If the firm has already exited a 4-digit SIC value in a prior year, subsequent years are deleted. If the firm never uses a 4-digit SIC code, all years related to that 4-digit SIC code are dropped. Only manufacturing SIC 4-digit codes are used.	Trinet data
Independent variables			
3. Product-market relatedness $_{kt-1}$	Sales-weighted concentric diversification index; reflects the product market relatedness between the scope choice and all other industries in which firm k has operations in year t.	This is a relatedness measure based on every 4-digit SIC firm k competes in compared to its target business. The percentage of firm k's sales in each 4-digit SIC are weighted by a value that depends upon the distance between the target industry and all the other industries in which firm k has operations. Values were weighted by 2 if the businesses were within the same three-digit SIC code, 1 if the businesses were within the same 2-digit SIC code and 0 if the businesses are in different 2-digit industries.	Trinet data

Variables of interest	Definition	Description	Data Source
4. Environmental relatedness $_{kt-1}$	Reflects the environmental relatedness between the scope choice and all other industries in which firm k has operations in year t; this variable reflects three different dimensions of the environment: munificence, complexity and dynamism. Blau method.	This is a relatedness measure based on a PCA of 20 environmental variables, where three factors emerged - munificence, complexity and dynamism. 14 variables loaded on these factors. Munificence is a composite variable of V1, V2, V3, V4 and V5. Complexity is a composite variable of V16, V17, V18, V19 and V6. Dynamism is a composite variable of V11, V12, V13 and V15. Based on every 4-digit SIC firm k competes in, create a sales weighted sum reflecting the firm's average level of munificence, complexity and dynamism. Compare the firm k's environmental score to the target's environmental score.	Trinet data U.S. Bureau of the Census *Census of Manufactures*
5. Interaction term between Product-market relatedness and Environmental relatedness $_{kt-1}$	Reflects the extent to which there is a synergy or an added explanatory value benefit coming from product-market relatedness and environmental relatedness together that is greater than the individual effects of these variables.	Create multiplicative interaction term between Product-market relatedness and Environmental relatedness by multiplying the two values together.	Trinet data U.S. Bureau of the Census *Census of Manufactures*
6. Average Product-market distance between entries $_{kt-1}$	An average measure used to reflect the average product-market relatedness between entries.	This measure is computed by: (1) taking the target's product-market relatedness score, and (2) summing it with all the other target entries' product-market relatedness score before it (up to that period), and (3) then dividing that total by the number of entries.	Trinet data
7. Average Environmental distance between entries $_{kt-1}$	An average measure used to reflect the average environmental relatedness between entries.	This measure is computed by: (1) taking the target's environmental relatedness score, and (2) summing it with all the other target entries' environmental relatedness score before it (up to that period), and (3) then dividing that total by the number of entries.	Trinet data U.S. Bureau of the Census *Census of Manufactures*
Control Variables *(firm-level)*			
8. Firm size $_{kt-1}$	Logarithm of total assets of firm i in year t-1.	Calculate variable using Compustat data.	Compustat data

Variables of interest	Definition	Description	Data Source
9. Leverage ratio $_{kt-1}$	Book value of long-term debt to market value of equity of firm i in year t-1.	Calculate variable using Compustat data.	Compustat data
10. Liquidity ratio $_{kt-1}$	Current assets divided by current liabilities of firm i in year t-1.	Calculate variable using Compustat data.	Compustat data
11. Return on assets $_{kt-1}$	Net income divided by total assets of firm i in year t-1.	Calculate variable using Compustat data.	Compustat data
12. Diversification $_{kt-1}$	Entropy measure – controls for the extent of the firm's diversification.	Berry-Herfindahl index of the firm's diversification.	Trinet data
(industry-level)			
13. Advertising intensity $_{kt-1}$	Advertising expenses divided by sales.	Calculate variable based using Compustat data.	Compustat data
14. Capital intensity $_{kt-1}$	Capital expenditures divided by sales.	Calculate variable based using Compustat data.	Compustat data
15. Market concentration $_{kt-1}$	Eight firm concentration ratio.	Using original value as covariate.	U.S. Bureau of the Census *Census of Manufactures*

Appendix G:

Descriptive Statistics and Correlations

		Mean	*StdDev*	1	2	3	4	5	6	7	8	9	10	11	12
1	Product-market relatedness	.33	.40												
2	Environmental relatedness	.79	.12	.24											
				<.0001											
3	AvgProductMktRel	.27	.30	.68	.18										
				<.0001	<.0001										
4	AvgEnvironmentalRel	.78	.10	.16	.51	.24									
				<.0001	<.0001	<.0001									
5	Firm size	8.68	.95	-.16	-.15	-.16	-.19								
				<.0001	<.0001	<.0001	<.0001								
6	Leverage ratio	.59	1.96	-.03	-.07	-.03	-.09	.10							
				.01	<.0001	.01	<.0001	<.0001							
7	Liquidity ratio	1.63	.60	.07	.16	.07	.19	-.42	-.06						
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001						
8	Return on assets	.06	.05	.07	.11	.10	.09	.00	-.14	.20					
				<.0001	<.0001	<.0001	<.0001	.97	<.0001	<.0001					
9	Product diversification	.19	.13	.21	-.04	.19	-.11	.10	.02	-.13	.02				
				<.0001	.00	<.0001	<.0001	<.0001	.14	<.0001	.06				
10	Advertising intensity	.04	.04	.14	.02	.10	.02	-.34	.05	-.05	.10	.18			
				<.0001	.09	<.0001	.03	<.0001	.00	.00	<.0001	<.0001			
11	Capital intensity	.06	.03	.00	-.05	.00	-.03	.33	-.06	-.28	.02	.24	-.26		
				.76	.00	.68	.02	<.0001	<.0001	<.0001	.08	<.0001	<.0001		
12	Market concentration	.49	.22	.23	.31	.16	.10	.06	-.01	-.01	.03	.04	-.01	.03	
				<.0001	<.0001	<.0001	<.0001	<.0001	.63	.41	.01	.00	.34	.01	

Note: Only correlations greater than .32 (representing 10%) of variance are interpreted since the large sample size makes most correlations statistically significant

Note: N = 7522

Appendix H:

GEE Logit Regression Predicting Likelihood of Entry

Variable	M1Estimate	M1ProbZ	M2Estimate	M2ProbZ	M3Estimate	M3ProbZ	M4Estimate	M4ProbZ
Intercept	-3.26	.000	-3.00	.001	-2.62	.004	-2.61	.004
Firm size	.25	.001	.25	.002	.26	.002	.26	.002
Leverage ratio	.02	.196	.01	.407	.01	.610	.01	.615
Liquidity ratio	.21	.020	.10	.366	.10	.363	.10	.368
Return on assets	.33	.731	.25	.803	.28	.782	.28	.779
Product diversification	1.02	.028	.75	.128	.75	.132	.75	.131
Advertising intensity	-1.04	.305	-1.26	.220	-1.17	.250	-1.17	.250
Capital intensity	-1.27	.471	-1.47	.413	-1.72	.348	-1.72	.347
Market concentration	-.29	.056	-.72	.000	-.62	.000	-.62	.000
Product-market relatedness			3.50	.000	.87	.000	.87	.000
Environmental relatedness					.11	.001	-.11	.003
PMR*ENVR							-.26	.887
Deviance	4902.41		4472.87		4465.91		4465.88	
Difference in Log Likelihoods			-214.77		-3.48		-.01	
Log Likelihood	-2451.20		-2236.44		-2232.95		-2232.94	
DF Comparing previous model)			1		1		1	
Chi-Square			429.53		6.97		.03	
p-value			.000		.008		.869	

Appendix I:

GEE Logit Regression Predicting Likelihood of Exit

Variable	M1 Estimate	M1 ProbZ	M2 Estimate	M2 ProbZ	M3 Estimate	M3 ProbZ	M4 Estimate	M4 ProbZ	M5 Estimate	M5 ProbZ
Intercept	.26	.744	1.61	.032	1.16	.118	1.21	.097	1.40	.146
Firm Size	-.03	.636	-.12	.060	-.13	.027	-.15	.009	-.17	.008
Leverage ratio	-.01	.627	-.01	.570	-.02	.464	-.02	.393	-.02	.386
Liquidity ratio	-.05	.533	-.03	.638	-.02	.830	-.02	.821	-.03	.695
Return on assets	.03	.970	.44	.583	.65	.433	.64	.449	.83	.336
Product diversification	.40	.279	-.22	.497	-.14	.666	-.09	.769	-.20	.550
Avertising intensity	.76	.630	1.42	.334	1.36	.373	1.37	.366	1.06	.483
Capital intensity	.17	.928	.22	.904	.40	.826	.65	.724	.46	.805
Market concentration	-.86	.000	-.41	.033	-.27	.183	-.20	.327	-.20	.333
Product-market relatedness			-1.30	.000	-.47	.000	-.53	.000	-.43	.000
Environmental relatedness					-.12	.009	-.09	.031	-.11	.045
PMR*ENVR							3.92	.001	3.94	.001
AvgProductMktRel									-.65	.031
AvgEnvironmentalRel									.27	.647
Deviance	4050.03		3916.65		3909.61		3894.71		3886.10	
Difference in Log Likelihoods			-66.69		-3.52		-7.45		-4.31	
Log Likelihood	-2025.01		-1958.33		-1954.81		-1947.36		-1943.05	
DF Comparing previous model)			1		1		1		2	
Chi-Square			133.38		7.04		14.90		8.62	
p-value			.000		.008		.000		.013	

Appendix J:

Proposed Effects and the Findings

ENTRY (DV)	Proposed sign	Findings
H1 Product-market relatedness	+	+, significant
H2 Environmental relatedness	+	-, significant
H3 Product-market relatedness * environmental relatedness	+	-, not significant
H4 Product-market relatedness will have a stronger influence on the direction of a firm's entry choices than environmental relatedness	Larger beta on product-market relatedness coefficient	supported
EXIT (DV)		
H5 Product-market relatedness	-	-, significant
H6 Environmental relatedness	-	-, significant
H7 Product-market unrelatedness will have a stronger influence on the direction of exit than environmental unrelatedness Product-market relatedness * environmental relatedness	Larger beta on product-market relatedness coefficient -	supported +, significant
H8a Average product-market distance between entries	-	-, significant
H8b Average environmental distance between entries	-	+, not significant

References

Allison, G.T. 1971. ***Essence of decision: Explaining the Cuban missile crisis.*** Boston: Little Brown.

Allison, P. 1995. ***Logistic regression analysis using the SAS System: A practical guide***. Cary, NC: SAS Institute Inc.

Allison, P. 1995. ***Survival analysis using the SAS System: A practical guide***. Cary, NC: SAS Institute Inc.

Amburgey, T.L., & Miner, A.S. 1992. Strategic Momentum: The Effects of Repetitive, Positional, and Contextual Momentum on Merger Activity. ***Strategic Management Journal***. 13(5): 335-348.

Amit, R., & Schoemaker, P.J.H. 1993. Strategic assets and organizational rent. ***Strategic Management Journal*****,** 14(1): 33-46.

Anderson, C.R., & Paine, F.T. 1975. Managerial perceptions and strategic behavior. ***Academy of Management Journal***. 18(4): 811-823.

Andrews, K.R. 1971. ***The concept of corporate strategy.*** Homewood, Ill.: Dow Jones-Irwin.

Ansoff, H.I. 1965. ***Corporate strategy***. New York: McGraw-Hill.

Argote, L. 1999. ***Organizational learning: Creating, retaining, and transferring knowledge.*** Boston: Kluwer Academic Publishers.

Argote, L., & Ingram, P. 2000. Knowledge transfer in organizations: Learning from the experience of others. ***Organizational Behavior & Human Decision Processes,*** 82(1): 150-169.

Bailey, E. E., & Friedlaender, A.F. 1982. Market Structure and Multiproduct Industries. ***Journal of Economic Literature***, 20(3): 1024-1048.

Barney, J.B. 1986. Strategic factor markets: Expectations, luck and business strategy. ***Management Science,*** 32(10): 1231-1241.

Barney, J. 1991. Firm resources and sustained competitive advantage. ***Journal of Management.*** 17(1): 99-120.

Barr, P.S., & Stimpert, J.L. & Huff, A.S. 1992. Cognitive change, strategic action, and organizational renewal. ***Strategic Management Journal***. 13: 15-36.

Bass, F.M., Cattin, P., & Wittink, D.R. 1978. Firm effects and industry effects in analysis of market structure and profitability. ***Journal of Marketing Research***. 15(1): 3-10.

Baumol, W.J., Panzar, J.C., & Willig, R.D. 1982. ***Contestable markets and the theory of industry structure.*** New York: Harcourt Brace Jovanovich.

Bettis, R.A., & Mahajan, V. 1985. Risk/return performance of diversified firms. ***Management Science***, 31(7): 785-799.

Bourgeois, III L.J. 1980. Strategy and environment: A conceptual integration. ***Academy of Management Review.*** 5(1): 25-39.

Bourgeois, III L.J., & Eisenhardt, K.M. 1988. Strategic Decision Processes in High Velocity Environments: Four Cases in the Microcomputer Industry. ***Management Science***, 34(7): 816-835.

Carter, E.E. 1971. The behavioral theory of the firm and top-level corporate decisions. ***Administrative Science Quarterly.*** 16(4): 413-428.

Caves, R.E. 1987. ***American industry: Structure, conduct, performance.*** Englewood Cliffs, NJ: Prentice-Hall.

Chang, S.J. 1996. An evolutionary perspective on diversification and corporate restructuring. ***Strategic Management Journal.*** 17(8): 587-611.

Chang, S.J., & Singh, H. 1999. The impact of modes of entry and resource fit on modes of exit by multibusiness firms. ***Strategic Management Journal***, 20(11):1019.

Chandler, A.D. Jr. 1962. ***Strategy and structure: Chapters in the history of the American industrial enterprise.*** Cambridge, MA: M.I.T. Press.

Chatterjee, S. & Wernerfelt, B. 1991. The link between resources and type of diversification: Theory and evidence. ***Strategic Management Journal***. 12(1): 33-48.

Child, J. 1972. Organizational structure, environment, and performance: The role of strategic choice. ***Sociology***. 6: 1-22.

Christensen, H., & Montgomery, C. 1981. Corporate economic performance: Diversification strategy versus market structure. ***Strategic Management Journal***. 2: 327-343.

Cohen, M.D. & Bacdayan, P. 1994. Organizational routines are stored as procedural memory: Evidence from a laboratory study. ***Organization Science***. 5(4): 554-568. Reprinted in Cohen, M.D., & Sproull, L.S. (Eds.) ***Organizational Learning***: 403-429. Thousand Oaks, CA: Sage Publications.

Cohen, M., & Sproull, L. 1991. Editor's Introduction. ***Organization Science***, 2(1) Special Issue: Organizational Learning: Papers in Honor of (and by) James G. March.

Cohen, M., & Sproull, L. (Eds.) 1996. ***Organizational learning***, Thousand Oaks: Sage Publications.

Cohen, W. & Levinthal, D. 1990. Absorptive capacity: A new perspective on learning and innovation. ***Administrative Science Quarterly*** 35:128-152.

Collins, N., & Preston, L.E. 1968. ***Concentration and price-cost margins in manufacturing industries.*** Berkeley: University of California Press.

Cowan, D.A. 1986. Developing a process model of problem recognition. ***Academy of Management Review***, 11(4): 763-776.

Cyert, R.M., & March, J.G. 1963. ***A behavioral theory of the firm***. Englewood Cliffs, NJ: Prentice-Hall.

Dalton, J.A., & Penn, D.W. 1976. The concentration-profitability relationship: Is there a critical concentration ratio? ***Journal of Industrial Economics,*** 25: 133-142.

Dean, J.W., & Sharfman, M.P. 1996. Does decision process matter? A study of strategic decision-making effectiveness. ***The Academy of Management Journal***, 39(2): 368-396.

Dempster, A.P., Laird, N.M., & Rubin, D.B. 1977. Maximum likelihood from incomplete data via the EM Algorithm. ***Journal of the Royal Statistical Society***, Ser. B.,(39):1-38.

Dess, G.G., & Beard, D.W. 1984. Dimensions of organizational task environments. ***Administrative Science Quarterly***, 29(1): 52-73.

Dierickx, I., & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage, ***Management Science***, 35(12): 1505-1511.

Dill, W.R. 1958. Environment as an influence on managerial autonomy. ***Administrative Science Quarterly.*** 2:409-443.

Dosi, G. 1988. Sources, procedures, and microeconomic effects of innovation. ***Journal of Economic Literature,*** 26(3): 1120-1171.

Dhawan, R., & Lieberman, M. 1999. Comparative efficiency of US and Japanese automakers: A stochastic frontier production function approach. A paper presented at the Academy of Management Meetings, Chicago, Ill., and the 2000 Stanford Strategy Conference.

Duhaime, I.M., & Schwenk, C.R. Conjectures on cognitive simplification in acquisition and divestment decision making. ***The Academy of Management Review***, 10(2): 287-295.

Duncan, R.G. 1972. Characteristics of organizational environments and perceived environmental uncertainty. ***Administrative Science Quarterly.*** 17(2): 313-327.

Dutton, J.E., & Stumpf, S.A., & Wagner, D. 1990. Diagnosing strategic issues and managerial investment of resources. In P. Shrivastava & R. Lamb (Eds.), ***Advances in Strategic Management***, 6: 143-176. Greenwich, CT: JAI Press.

Eisenhardt, K. M. 1989. Making fast strategic decisions in high velocity environments. ***Academy of Management Journal.*** 32: 543-576.

Emery, F.E. & Trist, E.L. 1965. The causal texture of organizational environments. ***Human Relations***. 18: 21-32.

Farjoun, M. 1994. Beyond industry boundaries: Human expertise, diversification, and related industry group. ***Organization Science.*** 5: 185-199.

Fiol, M., & Lyles, M. 1985. Organizational learning. ***Academy of Management Review***. 10(4): 803-813.

Fredrickson, J.W. 1984. The Comprehensiveness of Strategic Decision Processes: Extension, Observations, Future Directions. ***The Academy of Management Journal***. 27(3): 445-466.

Fredrickson, J.W., & Mitchell, T.R. 1984. Strategic Decision Processes: Comprehensiveness and Performance in an Industry with an Unstable Environment. ***The Academy of Management Journal***, 27(2): 399-423.

Fredrickson, J.W., & Iaquinto, A.L. 1989. Inertia and Creeping Rationality in Strategic Decision Processes. ***The Academy of Management Journal***, 32(3): 516-542.

Gale, B. 1972. Market share and rate of return. ***Review of Economics and Statistics***, 54: 412-423.

George, K.D. 1968. Concentration, barriers to entry and rates of return (in Notes). ***The Review of Economics and Statistics*****,** 50(2): 273-275.

Ginsburg, A. 1990. Connecting diversification to performance: A sociocognitive approach. ***Academy of Management Review***. 15(3): 514-535.

Glick, W.H., & Miller, C.C., & Huber, G.P. 1993. The impact of upper-echelon diversity on organizational performance. In G.W. Huber & W.H. Glick (Eds.), ***Organization change and redesign: Ideas and insights for improving performance***: 176-214. New York: Oxford University Press.

Gorecki, K.D. 1975. An inter-industry analysis of diversification in the U.K. manufacturing sector. ***Journal of Industrial Economics***. 24: 131-146.

Gort, M. 1962. ***Diversification and integration in American industry***. Princeton: Princeton University Press.

Grant, R. M. 1996. Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. ***Organization Science***. 7(4): 375-387.

Grant, R.M. 1998. ***Contemporary strategy analysis: Concepts, techniques, and applications***. Third Edition. Malden, MA: Blackwell Publishers.

Gutmann, P. 1964. ***Economic growth: An American problem.*** Englewood Cliffs, NJ: Prentice-Hall.

Haleblian, J., & Finkelstein, Sydney. 1999. The influence of organizational acquisition experience on acquisition performance: A behavioral learning perspective. ***Administrative Science Quarterly.*** 44(1): 29-56.

Hannan, M.T., & Freeman, J. 1977. The population ecology of organizations. ***American Journal of Sociology.*** 82: 929-964.

Haveman, H. 1992. Between a rock and a hard place: Organizational change and performance under conditions of fundamental environmental transformation. ***Administrative Science Quarterly***, 37: 48-75.

Haspeslagh, P.C., & Jemison, D.B. 1991. ***Managing acquisitions: Creating value through corporate renewal***. New York, NY: Free Press.

Helfat, C.E. 1994. Evolutionary Trajectories in Petroleum Firm R&D. ***Management Science***. 40(12): 1720-1747.

Henderson, R., & Cockburn, I. 1994. Measuring competence? Exploring firm effects in pharmaceutical research. ***Strategic Management Journal***, 15, Special Issue: 63-84.

Hofer, C.W., & Schendel, D.E. 1978. ***Strategy formulation: Analytical concepts.*** St. Paul, Minn.: West Publishing.

Huber, George P. 1991. Organizational Learning: the Contributing Processes and the Literatures, ***Organization Science,*** 2(1): 88-115.

Ingram, P., & Baum, J. A. C. 1997. Opportunity and constraint: Organizational learning from operating and competitive experience. ***Strategic Management Journal,*** 18 (Summer Special Issue): 75-98.

Jemison, D.B., & Sitkin, S.B. 1986. Corporate acquisitions: A process perspective. ***Academy of Management Review***. 11(1): 145-163.

Jurkovich, R. 1974. A core typology of organizational environments. ***Administrative Science Quarterly.*** 19:380-394.

Kiesler, S., & Sproull, L. 1982. Managerial Response to Changing Environments: Perspectives on Problem Sensing from Social Cognition. ***Administrative Science Quarterly***, 27(4): 548-570.

Kim, D., & Kogut, B. 1996. Technology platforms and diversification. ***Organization Science***. 7(3): 283-301.

Lecraw, D.J. 1984. Diversification strategy and performance. ***Journal of Industrial Economics.*** 33: 179-198.

Lemelin, A. 1982. Relatedness in the patterns of interindustry diversification. ***Review of Economics and Statistics***. 64: 646-657.

Levitt, B., & March, J.G. 1988. Organizational learning. ***Annual Review of Sociology***. 14: 319-40.

Liang, K.Y. & Zeger, S.L. 1986. Longitudinal data analysis using generalized linear models. ***Biometrika***. 73: 13 -22.

Lindblom, C.E. 1959. The 'science' of muddling through. ***Public Administration Review.*** 19(Spring): 79-88.

Lindblom, C.E. 1979. Still muddling, not yet through. ***Public Administration Review.*** 39: 517-526.

Lipsitz, S.H., Fitzmaurice, G.M., Orav, E.J., & Laird, N.M. 1994. Performance of generalized estimating equations in practical situations. ***Biometrics***. 50: 270 -278.

Lipsitz, S.H., Kim, K., & Zhao, L. 1994. Analysis of repeated categorical data using generalized estimating equations. ***Statistics in Medicine***. 13: 1149 - 1163.

MacDonald, J. M. 1985. R & D and the directions of diversification. ***The Review of Economics and Statistics***, 67 (4): 583-590.

Manski, C.F., & McFadden, D. 1981. Alternative estimators and sample designs for discrete choice analysis. In C.F. Manski & D. McFadden (Eds.)

Structural analysis discrete data with econometric applications. Cambridge, Mass: MIT Press.

March, J.G. & Simon, H.A. 1958. ***Organizations.*** New York: John Wiley.

McCullagh, P. and Nelder, J.A.1989. ***Generalized Linear Models***. Second Edition, London: Chapman and Hall.

McLachlan, G.J. & Krishnan, T. 1997**.** ***The EM Algorithm and Extensions***. New York: Wiley.

Mitchell, W. 1989. Whether and when? Probability and timing of incumbents' entry into emerging industrial subfields. ***Administrative Science Quarterly***, 34: 208-230.

Miller, R.A. 1969. Market structure and industrial performance: Relation of profit rates to concentration, advertising intensity, and diversity. ***Journal of Industrial Economics***, 17(2): 104-118.

Miller, D., & Friesen, P.H. 1983. Strategy-making and environment: The third link. ***Strategic Management Journal***. 4: 221-235.

Mintzberg, H. 1978. Patterns in strategy formulation. ***Management Science***. 24: 934-948.

Mintzberg, H. 1973. ***The Nature of Managerial Work.*** New York: Harper & Row Publishers.

Montgomery, C.A., & Hariharan, S. 1991. Diversified entry by large firms. ***Journal of Economic Behavior and Organization.*** 15: 71-89.

Nelson, R., & Winter, S. 1982. ***An evolutionary theory of economic change.*** Cambridge, MA: Harvard University Press.

Nutt, P.C. 1976. Models for decision-making in organizations and some contextual variables which stipulate optimal use. ***Academy of Management Review.*** 1(2): 147-158.

Palepu, K. 1985. Diversification strategy, profit performance, and the entropy measure, ***Strategic Management Journal***, 6: 239-255.

Panzar, J.C., & Willig, R.D. 1981. Economies of scope. ***American Economic Review***. 71(2): 268-272.

Pennings, J.M., & Barkema, H., & Douma, S. 1994. Organizational learning and diversification. ***The Academy of Management Journal***. 37(3): 608-640.

Penrose, E. 1959. ***The Theory of the Growth of the Firm*** (M.E. Sharpe ed. 1980). White Plains: M.E. Sharpe.

Peteraf, M.A. 1993. The cornerstones of competitive advantage: A resource-based view. ***Strategic Management Journal***, (14)3: 179-191.

Porter, M.E. 1980. ***Competitive strategy: Techniques for analyzing industries and competitors.*** New York: Free Press.

Porter, M.E. 1985. ***Competitive advantage.*** New York: Free Press.

Porter, M.E. 1987. From competitive advantage to corporate strategy. ***Harvard Business Review***, 65(3): 43-59.

Prahalad, C. K., & Bettis, R.A. 1986. The dominant logic: A new linkage between diversity and performance. ***Strategic Management Journal***, 7: 485-501.

Priem, R.L., & Rasheed, A.M.A., & Kotulic, A.G. 1995. Rationality in strategic decision-processes, environmental dynamism and firm performance. ***Journal of Management***. 21(5): 913-929.

Quinn, J.B. 1978. Strategic change: Logical incrementalism. ***Sloan Management Review***. 20(1): 7-21.

Quinn, J.B. 1980. ***Strategies for change: Logical incrementalism.*** Homewood, Ill.: Richard D. Irwin.

Ramanujam, V., & Varadarajan, P. 1989. Research on corporate diversification: A synthesis. ***Strategic Management Journal,*** 10: 523-551.

Rhoades, S.A. 1973. The effect of diversification on industry profit performance in 241 manufacturing industries: 1963. ***The Review of Economics and Statistics***, (55)2: 146-155.

Roberts, E. B., & Berry, C.A., 1985. Entering new businesses: Selecting strategies for success. ***Sloan Management Review***, 27(3): 57-71.

Robins, J., & Wiersema, M. 1995. A resource-based approach to the multibusiness firm: Empirical analysis of portfolio interrelationships and corporate financial performance. ***Strategic Management Journal*****,** 16(4): 277-299.

Rumelt, R. P. 1974. ***Strategy, structure and economic performance.*** Cambridge, MA: Harvard University Press.

Rumelt, R. P. 1977. Diversity and profitability. ***Paper MGL 51, Managerial Studies Center, Graduate School of Management.*** University of California, Los Angeles.

Rumelt, R. P. 1982. Diversification strategy and profitability. ***Strategic Management Journal***. 3: 359-370.

Salter, M.S., & Weinhold, W.A. 1979. ***Diversification through acquisition: Strategies for creating economic value.*** New York: Free Press.

Scherer, F. M. 1980. ***Industrial market structure and economic performance.*** Chicago: Rand McNally. (Second Edition)

Scherer, F.M., & Ross, D. 1990. ***Industrial market structure and economic performance.*** Boston: Houghton Mifflin Company. (Third Edition)

Schwartz, B. 1978. ***Psychology of Learning and Behavior***. New York: W.W. Norton.

Schwenk, C.R. 1984. Cognitive Simplification Processes in Strategic Decision-Making. ***Strategic Management Journal***, 5(2): 111-128.

Selznick, P. 1957. ***Leadership in administration.*** New York: Harper & Row Publishers.

Simon, H.A. 1955. A behavioral model of rational choice. ***Quarterly Journal of Economics***. 69: 99-118.

Simon, H.A. 1976. ***Administrative Behavior*** (3rd Edition). New York: Macmillan (1st Edition 1945).

Singer, J. D., & Willett, J. B. 2003. ***Applied longitudinal data analysis: Modeling change and event occurrence.*** New York: Oxford University Press.

Singh, H., & Montgomery, C. 1987. Corporate Acquisition Strategies and Economic Performance. ***Strategic Management Journal***. 8(4): 377-386.

Silverman, B. 1999. Technological resources and the direction of corporate diversification: Toward an integration of the resource-based view and transaction costs economics. ***Management Science***. 45(8): 1109-1140.

Shepherd, W.G. 1970. ***Market power and economic welfare: An introduction.*** New York: Random House.

Skinner, B.F. 1953. ***Science and human Behavior.*** New York: Macmillan.

Starbuck, W.H. Organizations and their environments. In M.D. Dunnette (Ed.), ***Handbook of industrial and organizational psychology***: 1069-1123. New York: Rand McNally.

Stewart, J.F., Harris, R.S., & Carleton, W.T. 1984. The role of market structure in merger behavior. ***Journal of Industrial Economics***. 32: 293-312.

Stinchcombe, A.L. 1965. Social structure and organizations. In James March (Ed.) ***Handbook of Organizations***: 142-193. Chicago: Rand McNally.

Taylor, S.E. & Fiske, S.T. 1978. Salience, attention, and attribution: Top of the head phenomena. In L. Berkowitz (Ed.), ***Advances in Experimental Social Psychology***, 11. New York: Academic Press.

Teece, D.J. 1980. Economies of scope and the scope of the enterprise. ***Journal of Economic Behavior and Organization.*** 1: 223-247.

Teece, D.J. 1982. Towards an economic theory of the multiproduct firm. ***Journal of Economic Behavior and Organization.*** 3: 39-63.

Teece, D.J. 1984. Economic analysis and strategic management. ***California Management Review***. XXVI (3): 87-110.

Terreberry, Shirley. 1968. The evolution of organizational environments. ***Administrative Science Quarterly.*** 12: 590-613.

Thompson, J. D. 1967. ***Organizations in action.*** New York: McGraw-Hill.

Tosi, H., Aldag, R., & Storey, R. 1973. On the measurement of the environment: An assessment of the Lawrence and Lorsch environmental uncertainty subscale. ***Administrative Science Quarterly.*** 18(1): 27-36.

Tung, R.L. 1979. Dimensions of organizational environments: An exploratory study of their impact on organization structure. ***Academy of Management Journal.*** 22(4): 672-693.

Tushman, M., & Romanelli, E. 1985. Organizational evolution: A metamorphosis model of convergence and reorientation. In L.L. Cummings & B.M. Staw (Eds.), ***Research in Organizational Behavior***, 7: 171-222. Greenwich, CT: JAI Press.

Tversky, A., & Kahneman, D. 1974. Judgment under uncertainty: heuristics and biases. ***Science***. 185: 1124-1131.

Varadarajan, P. 1986. Product diversity and firm performance: An empirical investigation. ***Journal of Marketing***, 50(3): 43-57.

Wernerfelt, B. 1984. A resource-based view of the firm. ***Strategic Management Journal.*** 5(2): 171-180.

Wrigley, L. 1970. Divisional autonomy and diversification. ***Unpublished Doctoral Dissertation***. Harvard Business School.

Vita

Curba Morris Lampert was born in Concord, California on July 22, 1972, the second daughter of Vanette and Edward Morris. She graduated from Palm Desert High School, Palm Desert, California in 1990 and entered The University of California, Irvine in the fall of that year. She earned a Bachelor of Arts in Political Science from The University of California, Irvine in December of 1993. After working in marketing for close to two years, she entered the graduate public policy program at The University of Michigan, Ann Arbor in the fall of 1995. She earned a Masters in Public Policy from The University of Michigan, Ann Arbor in May of 1997. In September of 1997, she entered the doctoral program in Strategic Management at The University of Texas, Austin. In May of 1999, she married architect Alan W. Lampert and adapted her name to Curba Morris Lampert. She is co-author, along with Gautam Ahuja, of "Entrepreneurship in the Large Corporation: A Longitudinal Study of How Established Firms Create Breakthrough Inventions", published in Strategic Management Journal in 2001. She has accepted her first professorship at The University of South Carolina, Columbia starting in the fall of 2003.

Permanent Address: 1906 Pendleton Street, Columbia, SC 29201

This dissertation was typed by the author.